THE E3500 HAND HELD EXPLOSIVE DETECTOR E3500手持炸药探测器

User Guide用户指导

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Scintrex Trace Corp warrants that the products it manufactures and sells will be free from defects in materials and workmanship for a period of one (1) year from the date of shipment from an authorized Scintrex Trace Corp distributor or reseller. If a product proves to be defective within the respective period, Scintrex Trace Corp, at its option, will repair the defective product without charge for parts or labour, or will provide a replacement in exchange for the defective product. Batteries are excluded from this warranty. To obtain service under this warranty, customers must notify Scintrex Trace Corp of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. Our toll-free number within North America is 1-877-877-7147. If calling outside North America, our number is 1-613-224-1061. Support is available during normal working hours, 8:00 a.m. to 5:00 p.m., EST. Customers shall be responsible for packaging and shipping the defective product to the service center designated by Scintrex Trace Corp, shipping charges prepaid, and with a copy of customer proof of purchase. Scintrex Trace Corp shall pay for the return of the product to the customer if the shipment is to a location within the country in which the Scintrex Trace Corp.service center is located. Customers shall be responsible for paying all shipping charges, duties, taxes, and any other charges for products returned to any other locations. This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. Scintrex Trace Corp shall not be obliged to furnish service under this warranty:

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2. To repair damage resulting from improper use or connection to incompatible equipment;
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Before operating the E3500, become familiar with all the safety symbols and instructions in this guide to ensure that the equipment is operated and maintained safely.

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操作E3500之前，先熟悉一下所有的安全标志和使用说明，确保机器可以使用得当。

Regulatory Statement调整说明

This equipment has been tested and complies with the emission limits for “Class A” and immunity requirements of EN 61326:1997 + Amendment A1: 1998. A2: 2001, A3: 2003. Electrical equipment for measurement, control and laboratory use – EMC requirements and verification, in accordance with EMC directive 89/336/EEC (including amendments). For products safety, it complies to EN 61010-1:2001 in accordance with the Low Voltage Directive 72/23/EEC (amended by 93/68/EEC).

此设备经过测试,符合排放标准的"A级"和(EN)61326:1997 +修正案要求A1:1998年，A2:2001年,A3:2003年的免疫力要求。电气设备主要用于测量、控制和实验室使用- EMC要求与验证,符合89/336 / EEC指令(EMC包括修改)。产品安全符合EN 61010-1:2001低压指令72/23 / EEC(修改93/68 / EEC)。

Software Version软件版本

This User Guide covers operation of the E3500 with Operating Software, release date January 2009.

这本用户指南涵盖E3500的操作方法与操作软件，发布日期2009年1月。

Safety Instructions安全法规

The following safety instructions must be observed whenever the E3500 is operated, serviced, or repaired. Failure to comply with any of these instructions or with any other precaution or warning in the E3500 User Guide is in direct violation of the standards of design, manufacture, and intended use of the equipment. Scintrex Trace Corp assumes no responsibility for the customer's failure to comply with any of these safety instructions.

任何时候使用、保养或者维修E3500时必须遵守下列指标，未遵守E3500用户指导中任何一条指示或与任何一条其他预防措施或警告都属于直接违反设计、生产和故意使用设备的规定。Scintrex Trace Corp并不承担任何由于客户违反这些安全法规而引起的问题的责任。

Safety Symbols安全标志

The following safety symbols are used in this guide. The instructions and precautions associated with these symbols must be observed whenever the E3500 is operated, serviced, or repaired.
下列安全标志都用于指导书中，这些标志相关的说明和预防措施都必须在使用、保养以及维修E3500时被遵守。

WARNING This procedure can result in serious injury or loss of life if not carried out in proper compliance with all safety instructions. Ensure that all conditions necessary for safe handling and operation are met before proceeding
警告：如果不按所有的安全法规执行的话，这个过程可能导致严重损害或损坏。确保在使用之前所有的安全操作的必须的条件都符合。

Caution. Always refer to the text accompanying this symbol for instructions.
警示：总是参考随带标志所附带的文本说明。

Caution. Risk of electric shock.
警示：电击风险

On (Power)
开（电源）

Off (Power)
关（电源）

When operated on an external DC power source, the E3500 is connected directly to earth via a power supply cord. The following symbol is used to indicate a protective earthing conductor terminal in the equipment
当使用外部直流电，E3500通过电源线被直接连接到地，以下的符号是用来表明设备中的一个保护接地导线终端设备。

Before Operation操作前

Become familiar with all the safety symbols and instructions in this guide, to ensure safe operation and maintenance of the E3500.
熟悉这篇指南中所有的安全符号和指令,为确保安全使用和维护E3500。

Inspect the equipment for any signs of damage and read the User Guide completely.
检查设备有无任何损坏迹象，熟读用户指导。

Set up and verify the performance of the E3500 as specified in **Section 2 – Getting Started.**
开启核查E3500的运行情况，详细操作方法见**第2部分--开机**

Ensure that equipment and any devices or cords connected to it are properly grounded.
确保设备以及任何装置或者连线都连接上，并且正确的接地。

While Operating **操作时**

■Do not operate the equipment when its covers or panels have been removed.
■不要在设备的盖子或者面板拆卸之后操作
■Do not interrupt the protective earthing connection. Any such action can lead to a potential shock hazard that could result in serious personal injury or death.
■不要中断保护接地连接。任何此类行为会导致一个潜在的触电危险，导致个人严重受伤或者死亡。
■Do not operate the equipment if an interruption to the protective earthing is suspected ensure that the equipment remains inoperative until it is confirmed to be in a safe operating position.
■如果保护接地中断时不要操作设备，等机器被确保在一个安全的位置上才进行操作。
■Use only the type and rating of fuse specified by the manufacturer as appropriate for the equipment.
■只使用型号和功率跟厂家提供的功能一样的保险丝。
■Do not use repaired or modified fuses. Avoid any situations that could short-circuit the fuse(s).
■不要使用维修过或者修改过的保险丝，避免任何可能引起保险丝短路的情况发生。
■Do not attempt adjustments or perform any maintenance or repair procedure if the cover or panels are opened while the equipment is connected to a power source. Only qualified service personnel should perform any procedures required under these conditions.
■连接电源之后如果设备的盖子和面板打开了，不要试图调整或者进行任何的维护或者维修程序。只有合格的维修人员才能在这种情况下对设备进行必须的操作。
■Do not operate the equipment in the presence of flammable gasses or fumes – this is extremely Hazardous.
■不要在易爆的气体和烟气前操作设备---这是相当危险的。
■Do not attempt to perform any adjustment, maintenance or repair procedure that is not described in the User Guide.
■不要试图进行任何没有在指导书中提到的调整、维护或者维修。

Electrical Safety **电气安全**

To avoid risk of injury or death, always observe the following precautions before operating the E5000.
为了避免受伤或者死亡，必须在使用E3500之前遵守下面防范措施

Use only a power supply cord with a protective earthing terminal
只使用一个带保护地面终端的电源线

Connect the power supply cord only to a power outlet (3-prong receptacle) equipped with a protective earth contact. Never connect to an extension cord that is not equipped with a functioning protective earth contact.
电源线只连接到一个带有保护接地的接触器的电源插座（3-prong插座）。不要连接到没有带保护接地接触器的延长线。

Willfully interrupting the protective earth connection is prohibited.禁止故意中断保护接地的连接

SENSITIVITY TO SOLVENT COMPOUNDs: The E3500 is highly sensitive to certain solvent compounds commonly found in laboratories. Solvents such as carbon tetrachloride, chloroform or methylene chloride should never be introduced into the unit, as such compounds will severely

diminish detector sensitivity.
敏感性溶剂化合物:E3500对于特定的普遍存在于实验室的溶剂化合物非常敏感。例如四氯化碳、二氯甲烷、氯仿这些溶液永远不应该被引入到机器中，因为这类化合物会严重降低探测器灵敏度。

POTENTIAL ELECTRICAL HAZARD: The E3500 operates at high voltages and amperages. No component of the electrical system should ever be serviced with the power on. The electrical system includes all power supplies, transformers, electrical connections and fuses. Only qualified personnel should attempt repair or maintenance of the E3500 electrical system.
潜在的电气事故：E3500在高压和高电流下运行，一旦停止操作，所有的电气组件都应该关闭。电气系统包括所有的电源供应器、变压器、导线连接和保险丝。只有合格的人员才能对E3500的电气系统进行维修或者维护。

SENSITIVITY TO MOISTURE: Liquids should never be introduced into the E3500. Direct exposure to liquids may cause serious damage to system components. The E3500 is not water resistant, and should always be adequately protected from exposure to high humidity, precipitation and other sources of moisture.
对湿度的灵敏度：液体不能被引入到E3500中，直接引进液体可能会对系统组件引起严重的损害。E3500不能防水，必须得到充分的保护，防止在高湿度，复合物，和其他水分存在的地方裸露。

DAMAGE: Do not operate the equipment if it bears any sign of damage to any portion of its exterior surface such as the outer casing or panels.
损害：如果外表某一部分，比如外盒或者面板有任何损害的迹象时不要操作设备。

ELECTRICAL SHOCK: Some of the equipment's capacitors may retain an electrical charge even when the equipment is disconnected from its power source.
触电：一些设备的电容可能会在电源断开后还保留有一些电荷。

E3500 SENSOR: The E3500 sensor contains a dilute Alkaline solution of potassium hydroxide. This solution is mildly caustic and can cause skin irritation or damage sensitive surfaces (MSDS sheets). Do not ingest or get contents on skin. In case of skin contact, flush immediately with water. Care should be exercised to prevent rupture of the E3500 sensor membrane. Should the membrane be damaged and leakage occur, the sensor and area should be washed with a dilute solution of household vinegar. Used or damaged sensors should be stored in a Ziplok or equivalent bag. The E3500 sensor cannot be discarded without treatment (**Section 5 - Troubleshooting and Maintenance**).
E3500传感器：E3500传感器包含的氢氧化钾稀碱液。这种溶液是一种温和的腐蚀剂，能引起皮肤刺激或损伤敏感的皮肤（MSDS表）。不要摄取或者接触到皮肤。万一接触到皮肤，立即用清水冲洗。特别注意不要破坏E3500传感器膜上的疝气。如果膜被损坏发生泄漏时，传感器和周围的地方都必须用醋的稀释液清洗。使用过或损坏的传感器应储存在Ziplok或同样的袋子里。没有经过处理的传感器不能随便丢弃（第5部分--排除故障和维护）。

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SECTION 1 – OVERVIEW
第1部分--综述

1.1 General Background

The E3500 is a lightweight, hand-held, rapid-response explosives detector. It is used for detection of vapour or residue, which may indicate the presence of one or more of the following explosives:
E3500是一个轻型的，快速反应的手持炸药探测器。它是用来检测蒸气或残留物，这可能意味着存在下列一个或多个炸药:

H_2O_2	**NG**	**PN**	**4-ATN**	**TNT**
ONTA	**NQ**	**CL-20**	**ASA**	**3-NT**
Tetryl	**DNT**	**Semtex**	**HNS**	**Black Powder**
BTTN	**RDX**	**C-4**	**ETN**	**TATP**
TEGDN	**PETN**	**Detasheet**	**R-Salt**	**HMX**
Taggants	**AN**	**Primacord**	**Picric**	**Acid Dynamite**

Individuals may unknowingly contact trace amounts of explosives during their daily activities. An alarm generated by the E3500 indicates a need for further investigation by authorized personnel. **Alarms do not imply guilt of possession of an explosive substance on the part of any individual.**
个人在他们的日常活动可能在不知情的情况下接触微量的炸药。E3500警报的生成表明需要经被授权人的进一步调查。警报并不表示每个人都携带有炸药，并进行过犯罪。

Vapour sampling is performed by sampling the air in and around an area where explosives are suspected to be present. Particulate sampling is performed by wiping the surfaces of suspect articles and transferring the particulates collected onto a metal sample screen. The sample screen is then inserted into the E3500 for analysis. The analysis is usually completed within 20 seconds and the results displayed on the LCD (liquid crystal display). An alarm is indicated by a red light and an audible signal.
取样就是在被怀疑有炸药出现的地方或者周围的地方的空气里进行。微粒取样就是在被怀疑沾有炸药的物体上面进行擦拭，并将微粒采集到金属样品的屏幕上。然后将屏幕上的微粒放到E3500里面进行分析。分析通常是20秒内完成，结果显示在LCD(液晶显示器)。红灯和可闻讯号表明报警。

Under normal conditions, a fully charged NiMH battery will provide two to three hours of continuous operation (or analysis of more than 200 samples). The E3500 is supplied with a spare battery, and a charger capable of fully recharging a battery in one hour. Typical warm up time is one minute.
在正常情况下，一个完全充满电的镍氢电池可以连续工作两三个小时(或分析200多个品种的样品)。E3500配有备用电池，充电器能够在一小时内完成充电。标准的热身时间为一分钟。

1.2 Principles of Operation工作原理

The E3500 is a dual mode explosive detector capable of operating in vapour as well as in particle mode. The detection technology relies on thermal decomposition of explosives such as RDX, PETN, AN, Urea Nitrate, TNT, NG, TATP, and Taggants yielding to the formation of chemicals which specifically react with luminol to generate light. The amount of light generated by this

chemiluminescence reaction is directly proportional to the amount of explosives analyzed.
E3500是一种双重模式的炸药探测器，可以在中操作也可以是微粒模式。检测技术主要是依靠热分解类似于RDX, PETN, AN, Urea Nitrate, TNT, NG, TATP以及Taggants的炸药,使之形成化学物质与聚乙烯反应产生光。这种化学反应所产生的化学光的数量与炸药分析的数量成正比。

The three phases of the E3500 explosives detection process are the **sample collection cycle, analysis, and results phase.**
E3500探测炸药的三个周期分别是：取样周期，分析周期，结果显示周期。

1.2.1 Sample Collection Cycle循环采样

The E3500 operates in the **vapour and particulate modes**. The only difference between the two modes is in the sample collection cycle. The analysis cycle and results display are common to both modes. The Mode Selector Switch sets the E3500 to vapour or particulate mode. A schematic of the basic operation is shown in Figure 1-1 below.
E3500有模式和颗粒模式两种操作方式。这两种模式之间唯一的不同是在收集样品的周期。两种模式的分析周期和结果显示周期都是一样的，E3500可以在模式选择开关上面设置成水模式或者颗粒模式。原理图的基本操作是如图所示的下面。

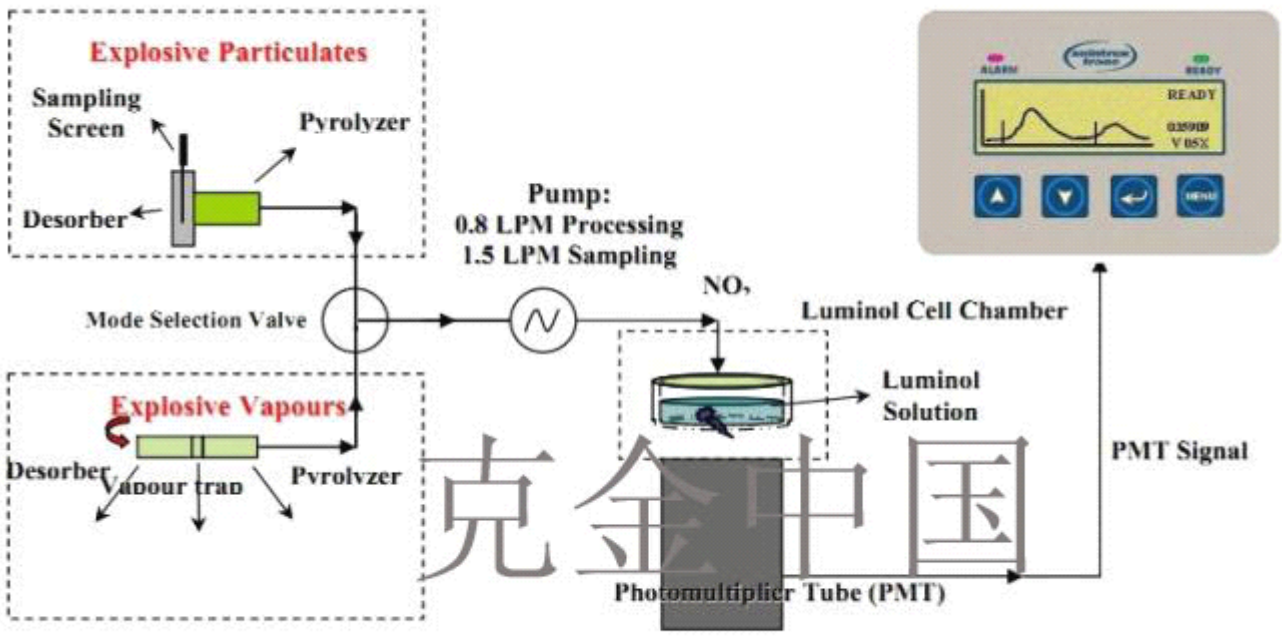

Figure 1-1 E3500 Basic Operation Schematic

1.2.2 Vapour Mode蒸气模式

With the E3500 set to vapour mode, pressing the **Sample Button** starts the **Sample Pump** that draws air into the unit through the **Vapour Inlet** at a flow rate of approximately 1.5 liters per minute. The air drawn into the E3500 passes through a **Vapour Collector Tab** that selectively adsorbs explosive vapour molecules. The duration of the sample time is adjusted by the **Technician** during calibration. Typically, sample times of five to fifteen seconds are used. During this time, the LCD

message center will show **Sampling**. Following the sample collection cycle, the analysis cycle is initiated.
E3500设置成水模式时，按“样品钮”启动样品泵，以每分钟大约1.5公升的流量通过进口吸引空气进入泵。空气通过收集标签卷入E3500，收集标签可以有选择的吸收炸药蒸气分子。样品的持续时间可以由技术人员在校准时随意调整。典型的情况是，样品时间可以在5到15秒内使用。在这段时间里，LCD显示信息中心将显示SAMPLE（取样）。随着取样周期结束，分析周期开始。

Following the sample collection cycle, the **Sample Pump** switches into a lower flow mode and the analysis cycle is initiated, the LCD will show **Processing**. The E3500 may be moved to another location while the analysis is being performed.
取样周期之后，将样品泵转为低流模式，分析周期开始。LCD显示器会显示出处理过程。在分析过程中，E3500可以任意方向移动。

1.2.3 Particulate Mode微粒模式

Using the **Mode Selector Switch**, the operator sets the E3500 to particulate mode. In the particle-sampling mode, sample collection is performed by the operator using a metal sample screen or cotton glove. In the case of glove sampling, the operator wipes the surface with a cotton glove, then rubs the glove onto the sampling screen. This screen is then inserted into the particle injector
See Figure 1-4 (page 1-6).
通过模式的选择开关，操作人员将E3500设置为微粒模式。微粒取样模式中，样品采集是由操作员使用金属样品屏幕或棉手套进行。手套取样是操作者用棉花手套在表面上擦拭，然后将手套上的样品放到样品屏幕上。然后将这屏幕插到微粒蒸气器中。见图1-4

The operator then presses the blue **Sample Button** to initiate the analysis cycle.
然后操作者按下蓝色的“样品钮”开始分析周期。

1.3 Analysis Cycle分析周期

1.3.1 Vapour Mode蒸气模式

The first step in the analysis cycle is the rapid heating of the **Vapour collector tab** for approximately 2.5 seconds. The tab is indirectly heated electrically to desorb the explosives which then move to the pyrolyzer. The elevated temperature of the pyrolyzer converts the organo-nitrate-based explosives molecules to NO_2 that is easily measured by the chemiluminescence detector. This method is known as thermo-chemiluminescence.
分析周期的第一步是快速加热“样品采集标签”，时间大约2.5秒。间接电加热标签来吸引流入热解器的炸药，高温的热解器使得有机硝酸盐成分的炸药分子转化成很容易被化学光探测器检测到的NO_2。这种方法就是所谓的“热化学光”。

1.3.2 Particulate Mode微粒模式

In the Particulate mode, the explosives are directly desorbed from the sampling screen to the pyrolyzer where they are converted to NO_2.
在微粒模式中，炸药从样品屏幕上直接被吸引到使之转化成NO_2.的热解器中。

The NO_2 is picked up in the air stream and transferred directly to the chemiluminescence sensor. As the NO_2 passes across the sensing surface of the detector, light is generated. The light is collected by a highly sensitive photomultiplier tube (designed for single photon counting), which converts light into an electrical signal. The electrical signal is sent to a micro-processor that measures the signal strength.
NO_2是从空气中的水提取的并直接转移到化学发光传感器。由于NO_2经过探测器的传感器表面生成光。光线被高度敏感的光电倍增管(专为单光子计数)采集，把光转换成电信号。电气信号被传送到测量信号强度的微处理器。

The overall sampling and analysis time is about **20 seconds**. During this time, the LCD message center will show **Processing.**
全部的采样及分析时间大约是20秒。在这段时间里,液晶显示屏信息中心将显示处理过程。

1.4 Results Phase结果显示周期

The presence of explosives is verified when the signal strength exceeds the alarm threshold within a time window expected for the explosives. If explosives are detected, an "**ALARM**" message will be displayed (see figure 1-2). The microprocessor calculates a number that represents the strength of the measured signal. This number is displayed on the LCD screen as the **Peak Height = xxxx** and **Peak Area = xxxx** values at the end of the analysis period, Figure 1-3 on page 1-5. The displayed value is already corrected (i.e. Minus threshold value (THH), for instance if THH is 2000 and the total signal is 5000 then the displayed number will be 3000). At the end of the sampling process the result is graphically displayed on the LCD and an alarm sound will be audible if a trace of explosives was found. At the same time the **Red LED** will be lit.
当信号强度超过预期的时窗时就证明了有炸药存在。如果炸药被检测到，"警报"的信号将会显示出来(参见图1 - 2)。微处理器可以计算出一个数字来代表所检测到的信号，这个数字将显示在屏幕上，例如峰高=*****，峰面积=*****作为分析周期的结果。图1 - 3页1 - 5。显示的值已经纠正了【如下。减去阈值（THH），举例来说,如果THH是2000，
总的信号是5000然后显示的数字将是3000】。采样处理的最后，结果是用图表来显示在LCD显示屏上的，如果有炸药存在，便会自动报警。与此同时，红色LED等将会发光。

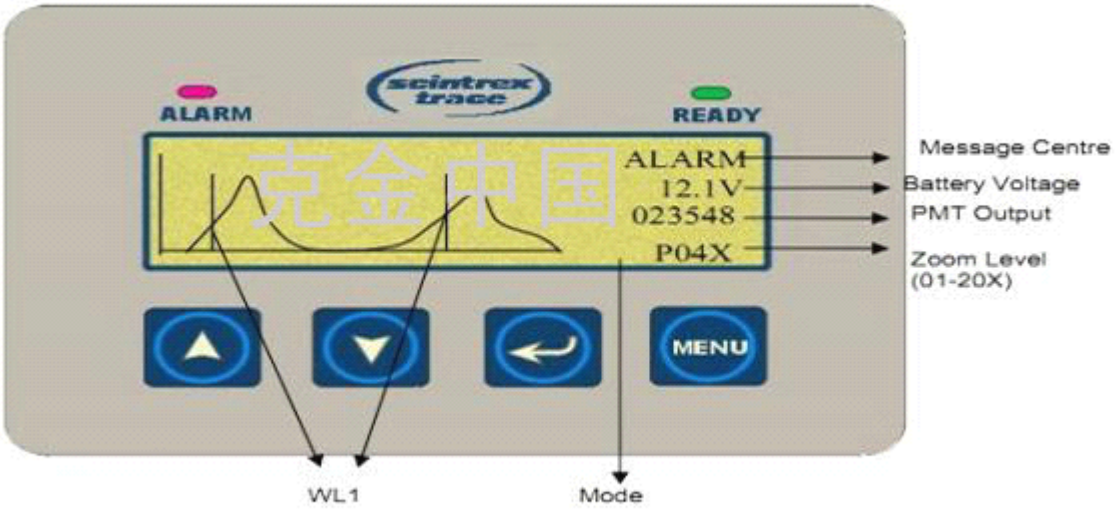

Figure 1-2 E3500 Graphical Result Display

a) **Curve**: the curve depicts the signal output from the sensor versus time. Whenever a suspicious material is found, the graph should show two peaks with different intensities (peak I > peak II).
a）曲线：曲线描绘了信号从传感器传出来的信号与实践。一旦有可疑的物质存在，图表就会显示出不同强度的两峰（I峰）II峰）

b) **Alarm**: if a positive identification has been found, then the Red LED and an audible sound will turn on. At the same time **ALARM** on **READY** will appear on the LCD.
b) 警报：如果真有可疑物质被发现，红色LED灯就会亮同时有警报发出。与此同时，LCD显示屏上就有会相应的结果显示。

c) **Battery Voltage**: the number represents the strength of the battery in volts. When the value blinks the unit will still be operational for about 30 minutes.
c) 电池组电压：这个数值代表了电池组的总电压。当这个电压值被断开了，还可以继续使用大约30分钟。

d) **PMT output**: the number represents the idle baseline value from the sensor. The typical value for this number is between 10,000 to 100,000. This number can be higher when the instrument is constantly being used
d) 输出值：此组数值代表传感器的闲置基线的数值。此组数值一般是10,000-100,000之间，如果机器持续使用此组数值可能会更高。

e) **Zoom Level**: the user can change the scale of the graph and zoom in and out by pressing the **up** and **down** arrow keys. The zoom level is indicated on the display (1-20X).
e) 变焦程度：用户可以按“up”和“down”按键改变图表的大小以及焦距的远近，缩放程度显示在屏幕上（1-20X）

f) **Mode**: the mode is indicated next to the zoom level. **P** is for Particle mode and **V** is for Vapour mode.
f) 模式：模式按键在“zoom level”隔壁，P代表“微粒模式”，V代表“蒸气模式”

g) **WL1**: the cursor indicates the reference point that the software is using to determine if an alarm condition exists. If the peak position is to the left of **WL1** the alarm will not sound; if the peak position is to the right of **WL1** the alarm will activate.
g) WL1:光标表明该软件是否有警报存在的参考点。如果峰的位置在WL1的左边，则表示报警器不会响；如果峰的位置是在WL1的右边，则报警器鸣响。

By pressing

the user can switch to the text window, where the numerical results are displayed.

通过按

，用户可以切换到文本窗口，数值结果将会显示在这里。

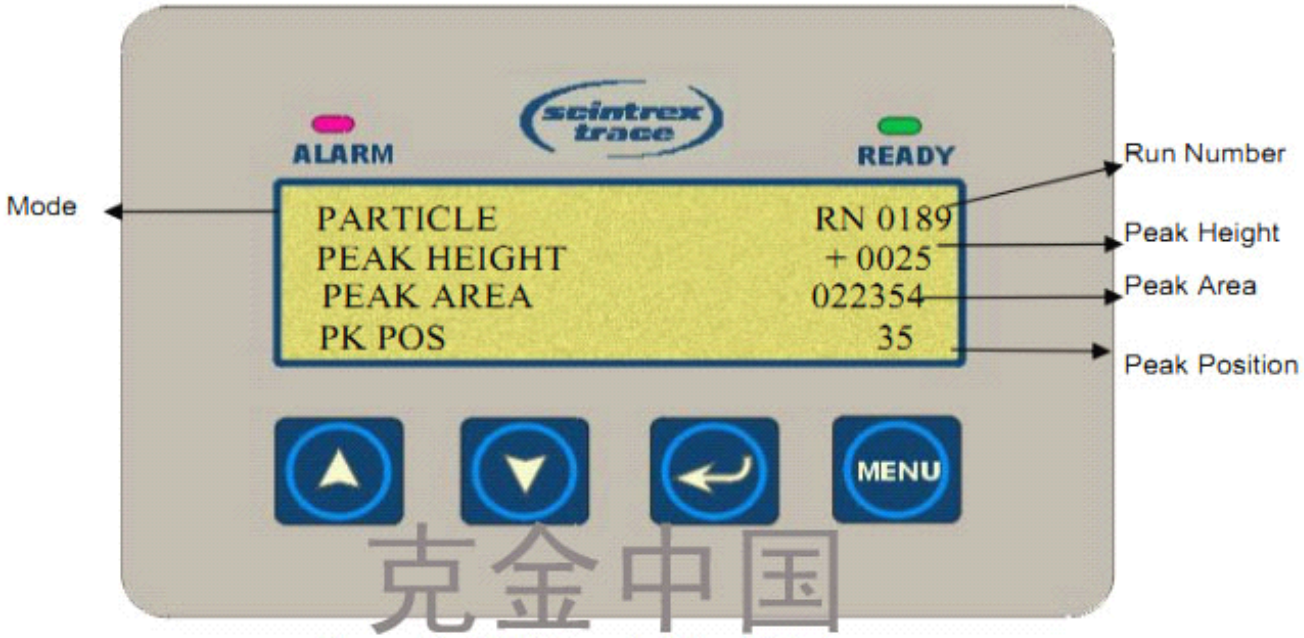

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Figure 1-3 E3500 Numerical Result Display

a) **MODE**: PARTICLE or VAPOUR.
a) 模式：微粒或者蒸气

b) **RUN NUMBER (RN)**: this value indicates the number of samples taken with one E3500 Sensor Cartridge.
b) **RUN NUMBER(RN):** 此数值表明E3500弹药筒使用样品的数量。

c) **PEAK HEIGHT**: the value represents the intensity of the signal. When an alarm is found, a **positive number** is displayed.
c) PEAK HEIGHT：此数值代表信号的强度。当发现警报，正数值将会显示。

d) **PEAK AREA**: this value is a different representation of the signal intensity. When an alarm is found

a **positive number** is displayed.
d) PEAK AREA：此数值是一个信号强度的不同表现，当有警报时，显示出来的数值是正数。

e) **PEAK POS**: the value represents position of the peak in time (Figure 1-3, i.e.: 35 is equivalent to 3.5 seconds). If the PK Pos is **less than the WL1** there will be no alarm.
e) PEAK POS: 此数字代表峰在不同时间的位置，(图1 - 3,例如：35相当于3.5秒)。当峰值小于WL1，便不会有警报。

1.5 Description of Parts 各个部分的描述

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Figure 1-4 The E3500

a) **Sample Button:** The blue **Sample Button** on the handle is used to initiate a sample cycle when the E3500 is in **READY** mode. It is also used to start the decontamination cycle.
a) Sample Button: 手柄上的蓝色样品键是当E3500在准备状态的时候用来开始循环样品采集阶段的，也可以用于去污周期。

b) **LCD – Keypad:** The LCD allows the user to visualize and navigate through various screens.
b) LCD-Keypad: LCD显示可供客户通过各种画面观看，操作。

c) **Mode Selector Switch:** The Mode Selector Switch is used to switch between Vapour and Particulate sampling modes.
c) Mode Selector Switch: 模式选择器开关是用来选择蒸气模式或者微粒模式的。

d) **Sample Screen Injector:** After a particulate sample is collected on a sample screen, the screen is inserted into the Sample Screen Injector.
d) Sample Screen Injector:（样品屏幕蒸气器）微粒样品采集放在样品屏幕之后，屏幕将会被插入到样

品屏幕注射器中。

e) **Vapour Inlet Nozzle:** The Vapour Inlet Nozzle is used to draw vapour samples directly into the E3500 for analysis.
e) Vapour Inlet Nozzle（蒸气进气喷口）蒸气进气喷口用来吸入蒸气样品，直接进入E3500分析。

f) **Battery:** The E3500 is powered by a 12-Volt rechargeable NiMH Battery that plugs into a receptacle in the **Rear Panel** of the unit.
f) Battery（电池）：E3500由12V的镍氢可充电电池插入机器后面的电池容器中供电。

1.6 Rear Panel 后面板

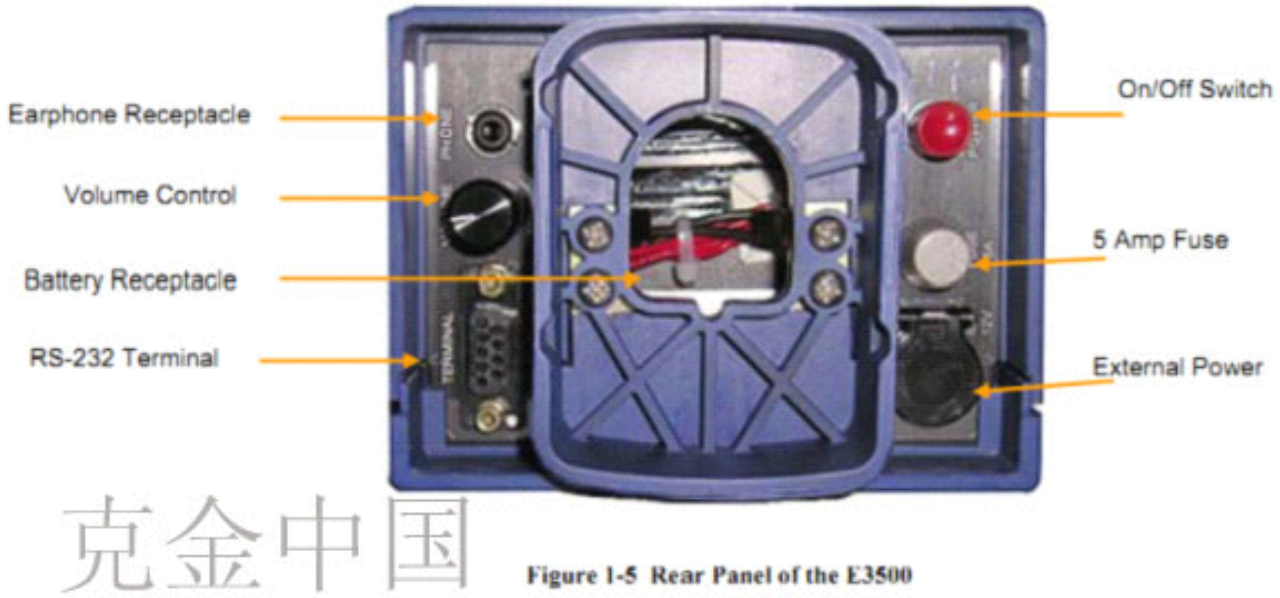

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Figure 1-5 Rear Panel of the E3500

a) **Power Switch:** The Power Switch is a push-on/push-off switch. It is used to start up the E3500 and to shut it off.
a) 电源开关：电源开关是“推进/推出”的开关，用来开启和关闭E3500.

b) **Volume Control:** The volume of the audible alarm can be adjusted by turning the Volume Control knob located on the left Rear Panel. Alternatively, the audible alarm can be immediately shut off by pressing any keys on the Keypad of the Display Panel. When another sample is initiated, the volume will return to the default setting of the control knob.
b) 音量控制：警报声可以通过后面板左边的音量控制旋钮调节；或者，警报声可以通过按显示板上的按键随时关掉。当另一种样品开始时，音量就会返回到默认设置的控制旋钮。

c) **Earphone:** Operators can connect an Earphone to the earphone receptacle in order to monitor for audible alarm signals, without disturbing other persons in the vicinity. Inserting an earphone jack into the earphone receptacle on the left Rear Panel disables the internal speaker of the E3500.
c) 耳机：操作者可以把耳机连接到耳机插口以监测警报声信号，而不干扰附近的其他人。把塞耳式耳机插到后面板左边的耳机插口，从而阻止E3500的扬声器发出声音。

d) **External Power:** The External Power Receptacle is used to connect the external 12 VDC battery vehicle adapter or an external AC power supply.
d) 外电源：外电源插口是用来连接外部12V直流电池适配器或者外部AC电源

e) **RS-232 Terminal:** The RS-232 Terminal is used to connect a computer terminal to download analysis results data.
e)RS-232终端接口：RS-232终端接口是用来连接电脑接口，从而可以下载分析结果的数据。

f) **Fuse Holder:** The fuse holder is mounted in the right Rear Panel which allows easy replacement of the 5 Amp main fuse.
f) 保险盒：保险盒安装在后面板的右边，可以简易的更换5 AM主保险丝。

1.7 Keypad and Display Panel按键以及操作面板

The **Keypad** and **Display Panel** in Figure 1-6 indicates the operating status and allows the Supervisor or Technician to change detection parameters.
键盘和显示器的显示在图1 - 6的运行状态和允许主管或技术员的变化检测参数。

It is recommended that parameter settings be adjusted only by designated, trained personnel.

建议参数的设置只能由指定的、经过训练的人来设置。

1.7.1 Status Indicators (LED)状态指示灯（LED）
There are two status LED's (light emitting diodes) located at the top of the Keypad and Display Panel illustrated in Figure1-6 below.
键盘和显示面板的顶端有两个状态指示灯（LED）详见下图1-6

The **green READY LED** illuminates when the E3500 is first turned on to verify that the LED is functioning; and when the unit is in **READY** mode (waiting for the operator to initiate a sample analysis).
首次打开E3500检验LED是否正常工作时，当E3500在预备状态时（等待操作者开始样品分析）绿色的预备灯发亮；

The **red ALARM LED** illuminates when the E3500 is first turned on to verify that the LED is functioning. The **red LED ALARM** is also initiated as a result of a positive detection; or if an error message is displayed on the LCD screen.
当E3500首次打开检验LED是否正常工作时，红色警报灯发亮。红色报警灯将作为积极检测的开始，否则错误信息将会显示在LCD显示板上。

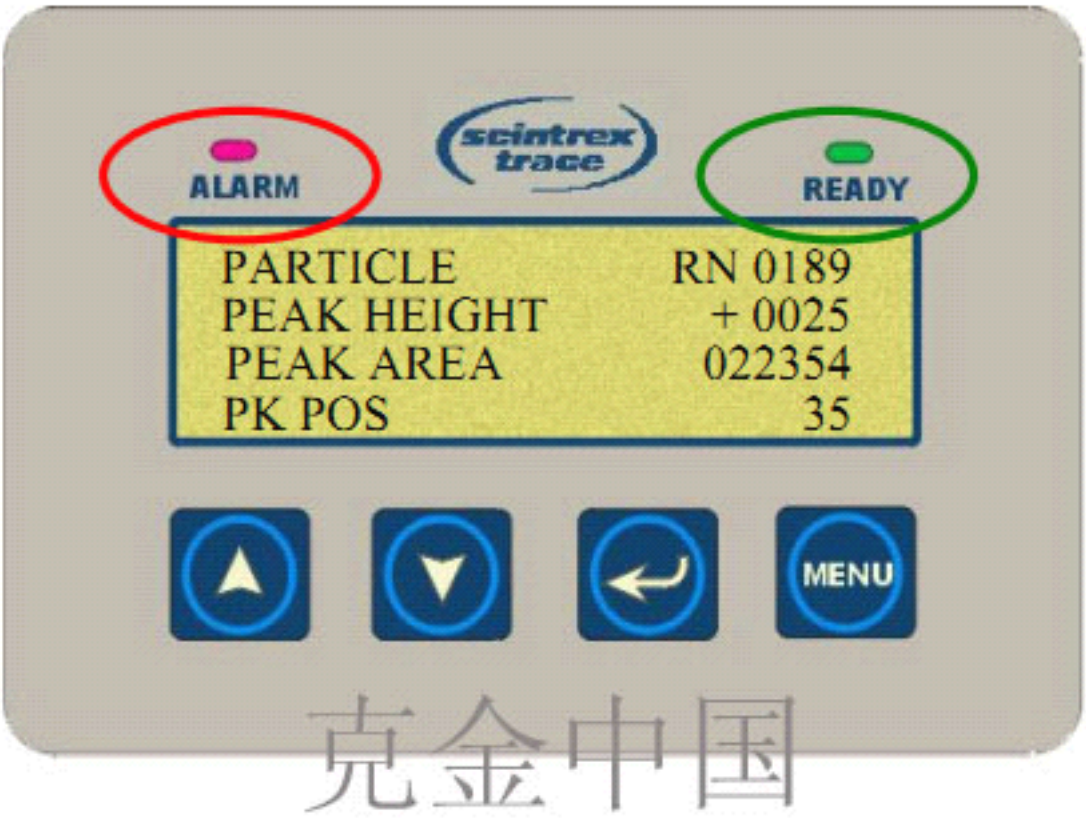

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Figure 1-6 Keypad and Display Panel

SECTION 2 – GETTING STARTED
第二部分 开始操作

2.1 Unpacking and Inspection开箱检验

The E3500 and its accessories are contained in a transportable carrying case. The case should only be opened when it is lying down flat. All items should be accounted for and should have been received in good condition. Open the case by unfastening the two latches at the front of the case. Remove each item from the case and verify it against the checklist shown in Table 2-1.
E3500及其配件的都被包含在一个可移动手提箱里。箱子只有在放平时才能打开，所有物品应该小心轻放，尽量保护好。打开箱子前面的锁，将箱子里所有的物品都拿出来。物品清单在下面2-1表中。

Inspect the exterior of the E3500 and its accessories for any evidence of damage resulting from shipping. If there are any discrepancies between the checklist and the items received, or if there is any evidence of damage, contact your Scintrex Trace Corp Sales Representative immediately.
检查E3500的外部以及各个零部件在运输中是否有任何损坏。如果跟收到的物件跟货物清单上面有任何误差，或者有任何损坏，可以直接与本公司联系。

Refrigerate unused E3500 sensors for long-term storage. 把E3500传感器冷藏起来，可以延长寿命

ITEM	CHECK-LIST	QTY	DESCRIPTION	PART NUMBER
1	☐	1	Carrying Case手提箱	943 213
2	☐	1	E3500 E3500	D350 505
3	☐	2	NiMH Battery 镍氢电池	D100 513
4	☐	1	Universal Battery Charger (90 V – 240 V)一般的电池充电器	D100 550
5	☐	1	Vapour Test Kit蒸气测试组件	D1000524
6	☐	1	Particulate Test Kit微粒测试组件	D1000526
7		12	Particulate Sample Screen	D350 532
8	☐	20	微粒样品屏幕	943 019
9	☐	1	Cotton Glove 棉手套	943 018
10	☐	5	Audio Earphone音频耳机	943 009
11	☐	1	5 Amp Fuse 5 Amp保险丝	D350 600
12	☐	1	User Guide 用户指导	D350 548
13	☐	1	E3500 Sensor (pack of 12)传感器	D100530
14	☐	1	USB to RS-232 Cable	1002866
15	☐	3	Shoulder Strap 肩章	540 006,000 359, 1002662
16	☐	1	Screwdrivers; Philips, Flat Head, Allen Key	D350 549
	☐	1	*Sample Accessory Kit (includes)样品组件*	D350 520
		1	Vapour Injector Assembly	D350 514
	☐	2	蒸气注射器装备	250 302
	☐	1	Particle Pyrolyzer 微粒热解器	943 210
	☐		Needle Probe, 2 inch long 2英尺长探针	
	☐		Nozzle Vapour 蒸汽喷嘴	

2.2 Powering the E3500给E3500通电

The E3500 can be powered by a re-chargeable Scintrex Trace Corp 12 Volt NiMH battery, an optional external 12 Volt DC battery, car adaptor, or an optional AC power supply. Under normal conditions, a fully charged NiMHattery can provide up to three hours of continuous operation.

E3500通过12V的可充电的镍氢电池通电，或者可以选用12V直流电池，汽车适配器，任意的AC电源。在通常情况下，全满的可充电镍氢电池可连续工作3小时。

The E3500 is supplied with a spare NiMH battery, and a charger capable of fully recharging a battery in approximately one hour. The NiMH battery is shipped in storage mode. The customer must provide a first time charge of two hours. It is recommended that both of the batteries be fully charged before

using the E3500. The battery charging procedure is described in Appendix A.
E3500出厂配有一个备用可充电镍氢电池，以及快速（一般为一小时）充电器。镍氢电池在运输过程中是密封的。首次使用建议连续充2个小时。建议两个电池在使用前必须充满，电池充电的详细描述见附录A。

2.3Connecting the Battery 装入电池

To connect the battery, remove the E3500, both batteries, and the charger from the carrying case. Then insert the battery into the receptacle at the rear of the E3500 and slide it forward, as shown in Figure 2-1 below. The battery should snap into place to ensure a proper connection.
连接电池,从箱子里面取出E3500，两个电池以及充电器。然后将电池插入到E3500后面板的电池容器,如图2 - 1的。
知道听见"咔哒"一声。

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Figure 2-1 Connecting the battery

2.4 Installing the E3500 Sensor 安装E3500传感器

Make sure that the E3500 Sensor is installed right side up and the cover closed. 确保E3500的传感器安装在正面同时盖子关闭好。

2.5 Turning on the E3500 启动E3500

After the battery has been installed, and the external battery or AC power supply has been connected, the E3500 can be turned on.
电池安装无误后，或者外部电池、直流电连接上以后，就可以启动E3500.

On the **Rear Panel** of the E3500, press the **on/off** power switch. **It takes two to three seconds for the E3500 to initialize**, after which time the display will indicate:
E3500的后面板上面，按on/off电源开关，两三秒之后E3500就会启动，启动时面板将会显示一下内容：

SCINTREX TRACE

E3500 V X.XX (Software version number)

Following an internal system check, the E3500 enters a initialization mode for aperiod of

approximately sixty seconds. The LCD will display **SELF-TEST** with a timer indicating the number of seconds remaining. When **SELF-TEST** mode ends, the E3500 enters **READY** mode shown in Figure 2-2. The green **Ready LED** remains illuminated and the red **Alarm LED** goes out.
随着系统内部检查，E3500进入了初始化阶段，时间大约为60秒。LCD显示面板会出现"SELF-TEST"显示剩下的自检时间。"SELF-TEST"模式结束后，E3500进入"READY"模式，如图2-2所示。绿色预备灯发亮，红色警报灯不发亮。

The E3500 is operational if the measured and displayed baseline value isbetween 10,000 and 100,000. If the baseline is not within the recommended range, see Section 5 - Troubleshooting and Maintenance.
当测试和显示出来的基线值在10,000和100,000之间时E3500可被使用。 如果底线不是在此范围内,见第5 部分-故障排除和维护。

If the battery indicator is steady in the graphical window, turn the E3500 off and recharge the battery or replace it with a fully charged battery.
如果图窗中电池指示器稳定，关闭E3500，然后给其充电，或者更换电池。

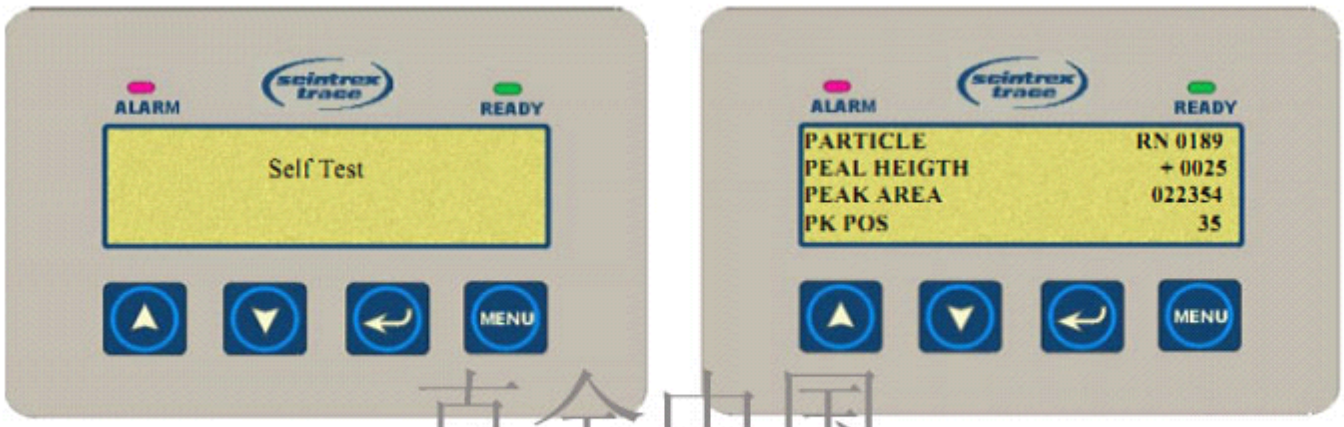

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Figure 2-2 Display in Self Test mode

2.6 Verifying Performance of the E3500检验E3500的运行情况

Prior to sampling for explosives, it is recommended that the operator verify that the E3500 is functioning properly by testing its performance using the appropriate test vials supplied. The Vapour Test Kit contains DMNB, while the Particulate Test Kit contains PETN.
抽样检查爆炸物之前，建议操作者先通过测试提供的药水来检查一下E3500的性能。蒸气测试组件包括DMNB，微粒测试组件包括PETN.

The performance verification of the E3500 should be done on an ongoing basis. Some instances include:
E3500性能检测应当在一项正在进行的具体事项中进行测试。比如：
■after transportation, 运输之后
■before it is first used for sampling operations, 首次取样操作
■at the beginning of each work day or shift, 在每一天每一项工作或每次交换的开始
■whenever the unit has been unused for an extended period of time, or the unit has been turned off, or每次机器闲置一段时间或者机器关闭了之后，
■whenever a malfunction is suspected.又或者当故障发生时

Performance is verified using background testing and vapour and particulate test kits.
通过各种背景测试以及蒸气、微粒组件来测试E3500的性能。

2.6.1 Vapour Mode 蒸气模式

Background Testing 背景测试

Background testing should be completed before verifying performance with the test kit. Background testing consists of an analysis that is done in a clean environment, free of explosives and explosives residues. The procedure is as follows:
背景测试应当在组件测试性能之前完成。背景测试包括在一个洁净的，没有任何爆炸物或者爆炸残留物中进行，程序如下：

1. When the unit has entered **READY** mode, set the E3500 to vapour sampling mode by pressing the **Mode Selector Switch** toward the front of the unit, as shown in Figure 2-3.
1. 当E3500进入预热状态，把Mode Selector Switch(模式选择键)向机器前方推，E3500设置成蒸气模式。如图2-3所示

2. Initiate a sample by pressing the blue Sample Button on the handle of the E3500. Do not hold the button down - press it only once. Once pressed:
2. 通过按一下E3500手柄上面的Blue Sample Button(蓝色样品键）启动抽样。注意不要长按键，一下就好。一旦按下去之后：
■The **Sample Pump** will be activated. 样品泵就会启动
■The green **Ready LED** will go out. 绿色预备LED不亮
■The LCD message center shows **SAMPLING**. LCD信息中心会出现SAMPLING(取样）

3. After approximately ten seconds, depending on the factory-set sampling time, the pump will switch to a lower flow mode. The E3500 will then analyze the sample for approximately 15 seconds, after which time (depending on the pre-set sample delay period) the green **Ready LED** will stay on. At this point the unit is ready for another sample. If an alarm occurs, it may have resulted from vapours that were trapped inside the pre-concentrator and the process should be repeated by depressing the sample button again.
3. 大约10秒后,凭借出厂默认设置的取样时间，水泵跳到低流模式。接着E3500分析样品，时间大约为15秒,取样时间到了之后绿色LED发亮。此时机器已经准备好分析另一种样品。 如果有警报声响，有可能里面的蒸气有了结果，此过程需要通过按样品键重新分析一次。

4. At the end of the analysis, the LCD will show the graphical representation of the result. When in the text window, if the numbers displayed (**PEAK HEIGHT or PEAK AREA**) are greater than the factory-set alarm threshold, an alarm will be initiated.
4. 分析结束之后，LCD上面会有图表显示结果，文字窗口中，当显示的数字（PEAK HEIGHT or PEAK AREA）比出厂设置的阀值高的话，会有警报。

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Figure 2-3 Mode selector switch to front for vapour sampling

Subsequent background test samples that consistently produce no alarms indicate that the background level and alarm threshold of the E3500 are set correctly for vapour sampling mode. It is common for the E3500 to initiate an alarm in response to the first few samples taken when the unit is turned on after an extended shut down period. This is a normal part of the initialization process and should be disregarded.
随后的背景测试样品持续没有警报产生说明的E3500的蒸气抽样模式的背景水平和报警阈值是正确的。在长期关闭之后，一时打开来测试前几个样品时候E3500会发出警报也是很常见的。这是一个正常的初始化过程，这种情况可以不用理会。

Testing with the Vapour Kit 蒸气组件测试
To verify that the E3500 responds properly to explosives vapours, a vapour test is performed using a vial containing DMNB. This test should be performed only after background testing has been completed.
为了证实E3500可以正确的对炸药蒸气做出反应，可以通过一小瓶DMNB来做一下蒸气测试。这个测试只有在背景测试完成之后才能进行。

Remove the vapour test vial from the E3500 carrying case. With the E3500 in **READY mode**, press the blue **Sample Button**, unscrew the lid of the test vial, and immediately place the opening of the vial over the **Vapour Inlet Nozzle** for approximately two seconds (see Figure 2-4 below).
从E3500箱子里面取出蒸气测试瓶子，在E3500预热状态时，按蓝色按钮,松开样品测试瓶的盖子,立刻让开放的瓶在蒸气进口喷嘴大约喷两秒(见图2 - 4)。

The test vial contains a small source of explosives vapours. To preserve the contents always ensure that the lid of the vial is kept tightly closed when it is not in use. When using the test vial partially cover the inlet nozzle with the opening of the vial to ensure accurate sampling.

测试瓶装有少量炸药蒸气，不使用时瓶子应该紧紧盖着以免气体被散发掉。当使用测试瓶时，应部分覆盖进口喷嘴，然后开瓶，以确保准确取样。
NOTE: The calibration should be done at near room temperature.
注意：应该在接近室内温度的情况下做好刻度。

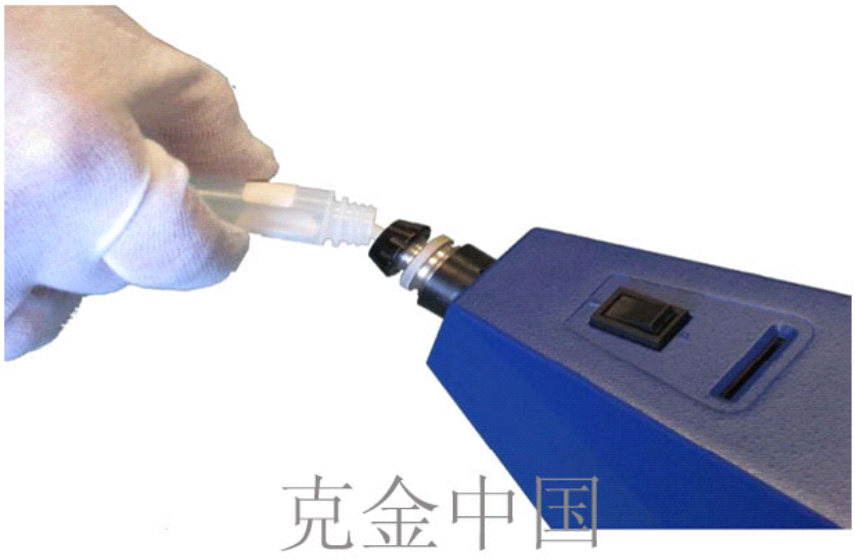

Figure 2-4 Vapour Mode Performance Verification

The pump switches to a low flow mode when the sample cycle is finished.Remove the test vial from the nozzle and screw the lid on.
循环采样周期结束水泵会转向低流模式。从喷嘴处移开测试瓶同时把盖子盖上。

Following the analysis, an alarm should be initiated. The alarm should activate and an audible signal heard (unless the volume was set low). If the numbers displayed (PEAK HEIGHT or PEAK AREA) are greater than the factory-set alarm threshold, an alarm will be initiated. If an alarm is not initiated by the vapour sampling test, refer to Section 5 - Troubleshooting and Maintenance.
随着分析结束，警报启动。警报声，信号声将会发出（除非音量被调的很低）。如果这些数字显示(峰的高度或峰面积)大于出厂设置的报警阈，警报就会鸣叫了。如果在蒸气取样测试中警报没有响，请参考第5节-故障排除和维护方面。

After the alarm is presented, run another test to clear the residue in the system. This is known as a blank test. Subsequent background test samples that consistently produce no alarms indicate that the background level and alarm thresholds of the E3500 are set correctly for particulate sampling mode. The unit should not alarm again, if so refer to Section 5 - Troubleshooting and Maintenance.
警报响后，开始另一个测试以便清除系统里面的残渣。这就是所谓的空白测试。随后的背景抽样测试如果一直没有警报声响则表明E3500在微粒抽样模式的背景水平以及报警阀值设置正确。机器不应该会再次鸣响，否则参阅第5 -故障排除和维护。

2.6.2 Particulate Mode微粒模式

Background Testing背景测试

Background testing should be done in a clean environment, before verifying performance with the particulate test kit.
背景测试应该在一个洁净的环境中，在核查微粒测试组件的性能之前进行。

When the unit has entered the **READY mode**, set the E3500 to particulate sampling mode by pressing the **Mode Selector Switch** toward the rear of the unit **(Note that each time the mode switch is activated, the instrument will go into a self-test mode)**. With a clean sample screen inserted into the **Injector Inlet**, (See Figure 2-6 on page 2-8) sample by pressing the **Sample Button** on the handle of the E3500. Do not hold the button down - press it only once for each sample. The LCD message center shows **Processing**.
当机器进入预热模式,通过把后面板上的模式选择开关推向机器前方，将E3500设置成微粒抽样模式。(注意,每一次开关启动,该仪器将进入一个自检模式)。用一块干净的样品屏幕插入注册器口,(见图2 - 6)通过按一下E3500手柄上的样品键，不要长按键不动，测试每种样品都只需按一下就可以了。LCD信息中心将会显示处理过程。

The E3500 will then analyze the sample for approximately 15 seconds, after which time (depending on the pre-set sample delay period) the green **Ready LED** will illuminate. At this point the unit is ready for another sample.
E3500接下来将会对样品进行分析，时间大约为15秒，15秒过后，绿色预备LED发亮，这时候机器已经准备好分析另一种样品。

Subsequent background test samples that consistently produce no alarms indicate that the background level and alarm thresholds of the E3500 are set correctly for particulate sampling mode.
随后的背景测试样品如何一直都没有警报声响，表明E3500在微粒抽样模式中的背景水平和报警阀值都设置正确。

Never handle sampling screens with your bare hands. The oil from human skin, if introduced into the E3500, interferes with the detection of explosives.

不要在没有佩戴任何手套的情况下对抽样屏幕进行处理。人皮肤上面的油脂，如果进入到E3500中，将会对炸药的探测起到干扰作用。

Testing with the Particulate Test Kit对微粒测试的组件进行测试

Prior to sampling for explosives it is recommended that the performance of the E3500 be verified using the particulate test kit supplied with the unit. The test kit contains a PETN verification pen. This test should be performed only after background testing has been completed, and after the background level and alarm threshold have been set. The procedure is as follows:

建议在对炸药进行抽样前先用机器本身提供的微粒测试组件对E3500的性能进行测试。测试组件包括PETN核查表。此机器只有在背景测试完成之后并且背景水平和报警阀值都已经设置好之后才能使用。程序包括以下内容：

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Figure 2-5 Particulate verification

Put the cotton gloves supplied with the unit on one of your hands, to ensure that you do not contaminate the unit or yourself. Remove the test kit from the E3500 carrying case. Remove the verification pen from the test kit. Gently apply medium pressure on the middle of the screen with the verification pen (as shown above). A small deposit of liquid should appear. Wait approximately 30 seconds to allow the deposit to dry.

一只手戴上机器本身提供的棉手套，以免弄脏了机器和你自己。把测试组件从E3500的手提箱里拿出来，同时从测试组件中取出测试笔。用中压力把测试笔轻轻的按在屏幕中间（如上图所示）。少量积存的液体会流出来，大约等30秒后，这些液体就会干。

Insert the sample screen into the **Injector Inlet** illustrated below, and then press the **Sample Button** to initiate an analysis cycle. The analysis should initiate an alarm.

把抽样的屏幕插到注册器进口（如下图所示），按一下样品键开始分析周期。分析会产生警报。

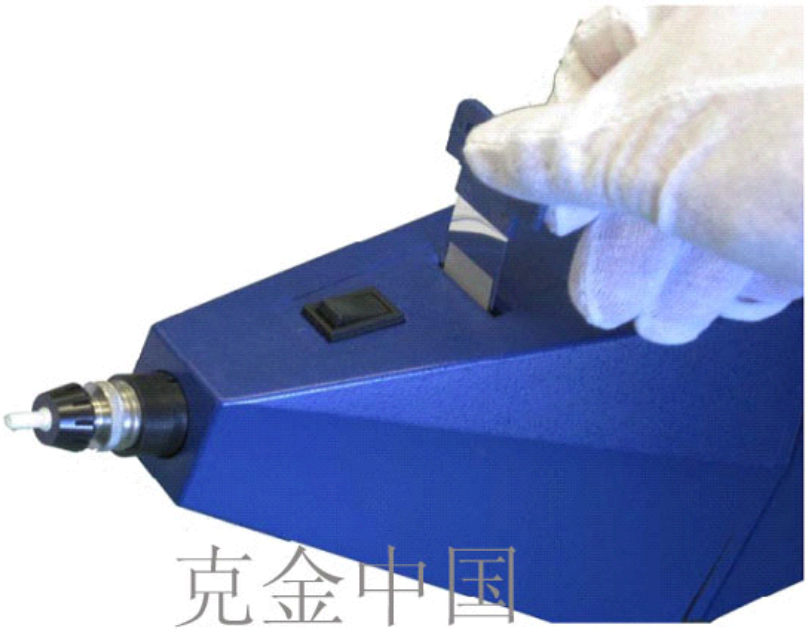

Figure 2-6 Inserting the sample screen

If the unit fails to respond with an alarm, repeat the procedure with an additional drop of liquid from the pen. If no alarm occurs after the second analysis cycle, refer to Section 5 – Troubleshooting and Maintenance.
如果机器没有产生警报，从笔中多按出一滴液体，重复上述过程。如果第二个分析周期还没有产生警报，参考第5部分的故障排除和维护。

After an alarm, start another test to make sure there is no explosive residue left in the system. This procedure is known as a blank test. If an alarm is still present, refer to Section 5 – Troubleshooting and Maintenance.
报警后，开始另一个测试来保证没有任何爆炸品残渣遗留在系统里，这个过程被称为空白测试。如果还有报警，参考第5部分--故障排除和维护。

2.7Turning Off the E3500关闭E3500

Whenever the E3500 is not to be used for an extended period of time, it should be turned off. Press the on/off power switch on the **Rear Panel**.
长期没有使用E3500，必须将其关闭。按后面板上的on/off电源开关。

SECTION 3 – OPERATION

第三部分--操作

After the E3500 has been set up, its self-test cycle completed, and the unit's performance verified, sampling can begin. As discussed previously, sampling is performed by either vapour sampling or particulate sampling.

开启E3500，自检完成，性能检验完毕之后，抽样即可开始。就像前面讨论的，抽样可以通过蒸气抽样或者微粒抽样来执行。

Vapour sampling is performed by sampling the air in and around an area where explosives are suspected to be present. Particulate sampling is performed by wiping the surfaces of suspect articles and transferring the particulates gathered onto a metal sample screen. The screen is then inserted into the **Sample Screen Injector Inlet** of the E3500 for analysis. The sample analysis is usually completed within 15-20 seconds and the results displayed on the LCD. An alarm or hit, is indicated by a red light, audible signal, and a value displayed on the LCD. If the analysis does not initiate an alarm, the next sample can be taken and analyzed. If a sample initiates an alarm, the operator must follow the appropriate procedures for the security environment they are working in and initiate the alarm clearing procedure (see Section 3.7 for more details on Clearing an Alarm).

抽样就是在被怀疑有炸药出现的地方或者周围的地方的空气里进行抽样。微粒取样就是在被怀疑沾有炸药的物体上面进行擦拭，并将微粒采集到金属样品的屏幕上。接下来把屏幕插入到E3500样品蒸气器进口中进行分析。样品分析通过在15-20秒内完成，结果会显示在LCD上面。红灯亮表示有警报，可闻信号以及估计结果都会显示在LCD上面。如果没有警报，可进行并分析另一种样品。如果样品产生警报，操作者必须遵循正当的程序，保证他们工作环境的安全来开始警报消除程序。（详见3.7部分的消除警报）

3.1 Battery Operating Requirements电池操作要求

Under normal conditions, a fully charged battery will provide up to 3 hours (or approximately 200 samples) of continuous operation. When the battery voltage falls to approximately 12 volts, the battery voltage indicator will blink until 11.5 Volts, as shown below in Figure 3-1.

正常的情况下，一个满的电池可以提供3小时（大约200种样品）连续工作。当电池低于大约12V时，电池电压指示器可以持续闪烁到11.5V，如图3-1所示。

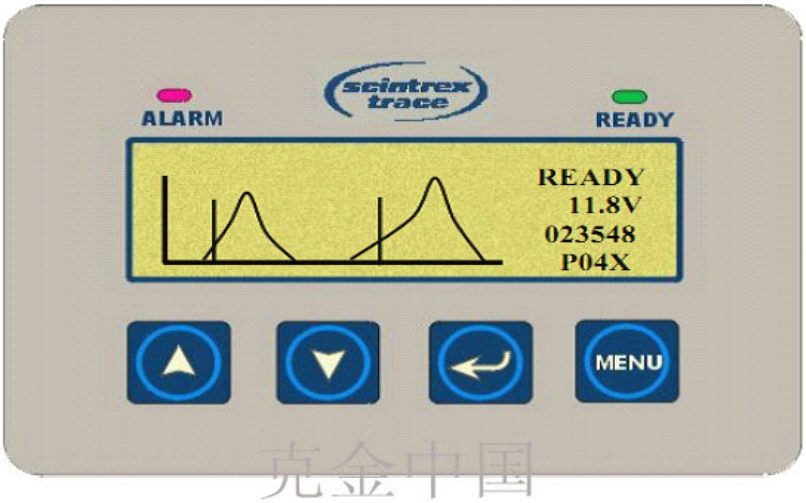

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Figure 3-1

When the battery indicator is blinking, the E3500 will operate for an additional thirty minutes before the battery is fully discharged and the E3500 stops operating.
当电池指示器闪烁的时候，E3500可以继续使用30分钟直到电池没有电了E3500才停下来。

When the battery voltage drops to 10.8 volts, the **BATTERY BELOW 10.8 V – SHUT DOWN** message appears on the LCD and samples can no longer be taken. (Figure 3-2). While one battery is being used to power the E3500, the other battery should be charging or fully charged and ready for use. It takes approximately one hour to fully charge a battery.
当电池只剩下10.8V时。"BATTERY BELOW 10.8V-SHOT DOWN"的信息就会显示在LCD上面，同时无法再抽样。（图3-2）当一个电池正在被E3500所使用时，另一个电池必须充满电以备不时之需。一般只需要大约1小时就能完成充电。

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Figure 3-2 Low Battery Message Displayed on LCD

3.2 Changing the Battery更换电池

To change the battery turn off the E3500 by pressing the on/off power switch on the **Rear Panel**. Press the battery lock mechanism and slide the battery out of the back of the unit. Slide a fully charged battery into place, and ensure that it snaps into position. Turn the unit on by pressing the on/off power switch on the **Rear Panel**. The unit will automatically enter **SELF TEST** mode.
按后面板的"on/off"电源开关关闭E3500进行更换电池。按电池锁和滑动电池，把电池从机器后面取出来，更换一个满电的电池，确保电池入位。打开机器，机器会先自动进入自检模式。

3.3 Self Test Mode自检模式

The **SELF TEST** mode will be initiated when the user performs **one of the following operations**:
自检模式在以下程序中都会被启动：
■Turning on the unit. 开启机器
■Switching from Vapour to Particle Mode and vice versa. 从蒸气模式转到微粒模式，反之亦然。
■After editing any operational parameters (not applicable to DATE or THRESHOLD values THA and THH).编辑了任何运行基数之后（日期，阀值数据以及THA和THH数值不当的时候）
■If the unit is left idle for 1 hour. 机器不用闲置一小时
■Opening and closing the E3500 Sensor Cartridge tray.开启或者关闭E3500的传感弹药筒发射器

At the end of each **SELF TEST** cycle the unit will automatically display the result

of the last blank sample. (See Figure 3-3).
每次自检之后，机器将会自动显示最后的空白样品的结果（图3-3）

Figure 3-3 Text Window

3.4 Changing the E3500 Sensor Cartridge更换E3500传感器弹药筒

The E3500 Sensor Cartridge will need to be changed every 2000 samples. The number of samples taken is indicated in the text window as **RN** (RN1500 would mean that the E3500 sensor was used 1500 times) (Figure 3-4).
每抽取了2000种样品之后，E3500传感器弹药筒必须更换一次。抽样的次数会在文本窗口显示如RN（RN1500意味着E3500传感器被使用过1500次）（图3-4）

Figure 3-4 Numerical Results Display

NOTE: If the unit has been stored in a cool place for a long period of time, the E3500 sensor may have a longer lifetime. Make sure that the sensor is installed right side up.
注意：如果机器长时间放置在阴凉处，传感器的寿命会更长一点。确保传感器是安装是右上方。

NOTE: **It is recommended to refrigerate the E3500 Sensors not in use, in its original package.**

However, the sensor may still be operational after 3 months stored at room temperature if they are remain in the sealed package. If the RN is between 1800 and 2000, then a symbol for the E3500 sensor will appear and blink, warning the user that the E3500 sensor is either close to its lifetime (2000 samples) or the expiration date is approaching 1 month, see Figure 3-5.
注意：建议E3500的传感器在不使用的时候，原包装放在冷藏处。然而,传感器在如果以原包装在室温下储存三个月有可能还可以使用。如果RN值在1800-2000之间，E3500传感器的标志就会显示同时闪烁，提醒使用者：E3500传感器要么使用期将至（2000个样品）要么有效期即将到1个月。见图3-5

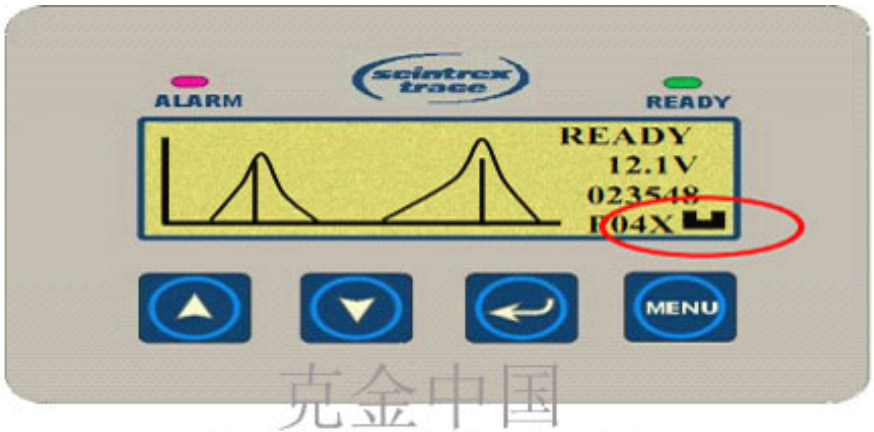

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Figure 3-5 Luminol Cell Status Window

If the cartridge has been inside the unit for more than a month, an error message **ERR-CELL** will be displayed on the LCD to warn the user about the status of the cartridge. Within 1 or 2 days from the expiration date, a number 1 or 2 will be displayed respectively as shown in Figure 3-4 (page 3-3).
如果弹药筒置于机器内超过一个月，错误的信息**"ERR-CEL"**会显示在LCD上面，提醒使用者弹药筒的状态，有效期后的1-2天内，数字1或者2会分别显示在屏幕上（图3-4）

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Figure 3-6 Error E3500 Sensor Cartridge Message

With the power on, use a flat screw driver to open the door on the side of the unit and open the tray to change the E3500 Sensor. An ERR-PMT-D message window will appear in the text window: (figure 3-7). Remove the sensor from the aluminum pouch and place the sensor inside the tray with the **membrane facing up** (soft side) and then close the tray.
开启机器,用平头螺丝打开机器旁边的盖子，打开匣子更换E3500的传感器。一个ERR-PMT-D讯息视窗将会出现在文本中:(如图3 - 7)。从铝袋中取下传感器，把匣子里面的传感器更换下来(软边朝上),盖子合上。

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Figure 3-7 Error PMT Door Message

At this point the user will be asked to reset the run number. When a new E3500 Sensor is used this number should be reset to zero. After the E3500 sensor has been replaced, the unit will go into **SELF TEST** mode and then will be ready for sampling.
这时用户需要重置RN，重新安装一个新的传感器，RN值必须重置为0.E3500的传感器更换后，机器自动进入自检模式准备取样。

3.5 How to Sample Vapours如何进行蒸气取样

Place the Vapour Inlet Nozzle of the E3500 near the area to be sampled. Press the blue Sample Button on the handle and the Sample Pump will immediately draw an air sample into the Vapour Inlet Nozzle, The LCD will display **SAMPLING** . The pump will remain on for five to fifteen seconds. This time can be adjusted by the user for specific applications. The **PROCESSING** message will be displayed on the LCD during the analysis cycle. After the pump switches to a low flow regime, the E3500 can be moved to a new location while the analysis is being performed. At the end of the analysis, the results will be displayed on the LCD. The overall time for a sample to be analyzed will vary from 15 to 20 seconds.
在进行采样的地方周围更换E3500的蒸气进口喷嘴。按一下手柄上的样品键，样品泵会马上吸引空气样品进入蒸气进口喷嘴，LCD上会显示"SAMPLING"(正在取样）。该泵会持续5-15秒，时间可由操作者根据具体情况自行调节。分析周期，处理信息会显示在LCD上面。泵转为低流后，分析结束之后E3500可以移到别的地方。分析周期结束之后，结果会显示在LCD上，分析周期总共时间为15-20秒。

3.6 How to Sample Particulates如何进行微粒取样

Take a sample from the suspect article and transfer it to a clean sample screen. With the E3500 in **READY** mode, insert the sample screen into the Sample Screen Injector Inlet of the E3500. Do not force the screen into the Sample Screen Injector Inlet or the screen may be damaged (if inserted correctly, the screen will slide in with little resistance). Press the blue Sample Button on the handle and the Sample Pump should immediately draw air into the E3500. The **PROCESSING** message will be displayed on the LCD during the analysis cycle. At the end of the analysis, the results will be displayed on the LCD similar to the default window shown in figure 1-2 on page 1-4 where the sample resulted in an alarm.

从一个可疑的物品上去下样品，把样品转移到干净的样品屏幕上。E3500进入预热状态时，把样品屏幕插入E3500样品屏幕注册器进口。不要强制屏幕进入样品屏幕注册器进口，否则屏幕有可能会被损坏。（如果插入正确，屏幕在小的推力下会自动滑进去）按一下手柄上面的样品键，样品泵马上吸入空气进入E3500. 分析周期的处理过程将显示在LCD上。分析周期结束，结果同样显示在LCD，跟默认的文本窗的结果都如图1-2所示。

3.7 Clearing the Alarm清除警报

NOTE: Remove the Sample Screen before clearing an alarm in **Particulate Sample Mode.**
注意： 微粒模式中清除警报先把样品屏幕移开。

Following the correct procedure to clear an alarm is a critical operational requirement. The alarm clearing procedure for the E3500 must be carried out in the proper sequence. Whenever an alarm condition is initiated, it is recommended that the operator verify that the unit has not been contaminated. This is done by pressing the **Sample Button** to initiate another analysis cycle. In most cases, this second cycle should result in a non-alarm condition, indicating that the unit is clean and is ready for another sample. In particulate sampling, the risk of contamination is much greater, since the explosive residue is desorbed entirely from the sample screen or the collector tube during the first cycle.
遵循正确的程序来清除警报是一个严格的操作要求。清除E3500的警报必须遵循正当的顺序。当有警报发生，建议操作者先检验一下机器是否弄脏：按一下样品键开始另一个分析周期。大多数情况下，第二个分析周期的结果都不应该都警报，这表明机器内并没有任何炸药残渣并可以开始另一个取样。在微粒取样中，机器被弄脏的几率比较大，因为第一个周期样品屏幕的炸药残渣会全部被吸入采集管道中。

When this occurs, the E3500 may continue to respond with alarms on subsequent sample cycles, even when no sample has been taken. The alarm clearing procedure is the same for nuisance alarms and alarms caused by the presence of explosives. When a repeated alarm condition is identified, remove the sample screen from the unit and thoroughly clean it with soap and water. Ensure that the decontaminated screen is rinsed with alcohol or acetone solution and thoroughly air-dried before reinserting it into the E3500.
当有这种情况发生，E3500可能会在采样周期持续发出警报，甚至是在没有进行取样的情况下也会。清除警报的程序跟警报滋扰以及有爆炸物存在时产生的警报是一样的。当识别到有重复的警报声，从机器上移开样品屏幕，用肥皂和水全面的清洗样品屏幕。确保洁净的屏幕已经经过乙醇和丙酮清洗过，并在插入到E3500前已经被风干。

Re-insert a new or decontaminated screen and press the Sample Button to ensure that there is no contamination still present. If contamination is still present a decontamination cycle must be run.
重新把新的洁净的屏幕插进去并按一下样品键确保没有任何污染物存在，如果还有污染物存在，排污周期继续运行。

3.8 Decontamination Cycle排污周期

1. Press

to return to the numerical result display.按

键返回数字结果显示

2. Simultaneously press the keys to obtain the Decontamination window seen below (see figure 3-8).同时按键获取一下排污窗口（图3-8）

Figure 3-8 Decontamination Cycle Option

3. After choosing yes the unit will proceed with the decontamination cycle, which lasts 60 seconds.
3. 选择yes机器便会开始排污周期，时间为60秒。

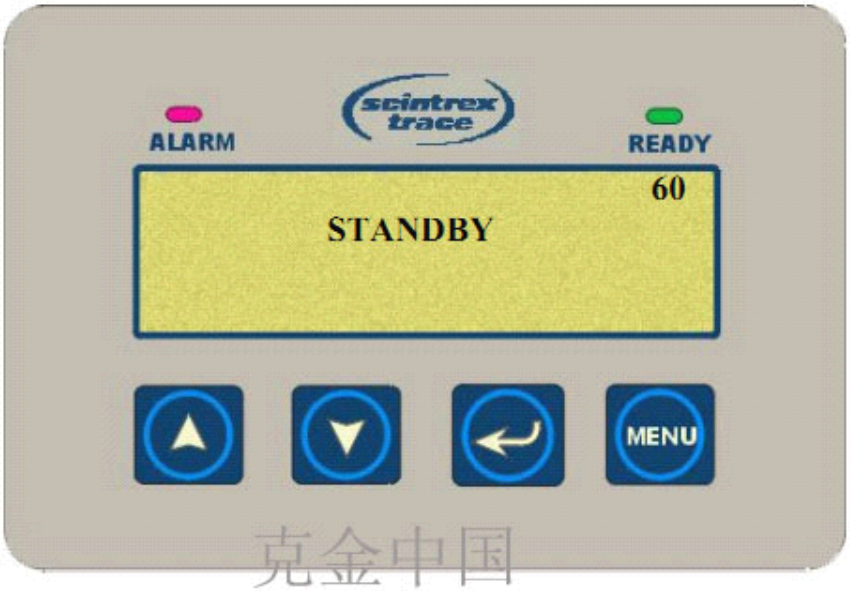

Figure 3-9 Decomtamination Cycle

4. The unit should be clear after the **decontamination cycle** has processed. If the unit is still not clear refer to Section 5 – Troubleshooting and Maintenance.
4. 机器通过排污周期之后会很干净，否则参考第5部分--故障排除和维护

SECTION 4 – APPLICATIONS
第四部分--应用

4.1 Sample Collection样品采集

4.1.1 Vapour Pressure 蒸气压力

Explosive compounds can be characterized according by their tendency to evaporate and release material into the air (vapour pressure). Explosives with a high vapour pressure (EGDN, Dynamite) produce and release more vapour at a given temperature. Explosives with a low vapour pressure (C-4, Semtex) release very little vapour. However, these materials can be detected if they are tagged according to the ICAO standard.

根据炸药化合物可以通过它们脱水的倾向以及在空气中释放原料被归类（蒸气压力)。在特定的温度下，一个更高的蒸气压力（EGDN, Dynamite)可以产生和释放更多的微粒。然而，这些材料当通过ICAO标准被附上标签之后就可以被探测到。

4.1.2 Vapour Sampling Background蒸气取样背景

High vapour pressure explosives can be detected by the E3500 in the vapour sampling mode. In an enclosed area, explosive vapours slowly fill the area until there is an almost equal distribution of vapour anywhere within the containment area.

高蒸气压力的炸药可以被E3500通过蒸气取样模式探测到。在一个密封的地方，炸药蒸气将会慢慢填充整个空间，除非此空间存在另一种几乎平均分配的蒸气。

The longer the explosive is present, the greater the amount, or concentration, of vapours present. Therefore, you would not have to be in the immediate vicinity of an explosive to collect a sample.

炸药出现的时间越长，蒸气存在的数量或者浓度越大。所以，你不用立即在有炸药的地方或者附近采集样品。

4.2 Vapour Sampling Methods蒸气采样方法

To collect a sample keep the nozzle of the E3500 pointed in the direction of the suspected vapour. Push the sample button on the handle of the unit and hold the nozzle until the LCD displays **PROCESSING**.

采集样品，把E3500的喷嘴对准可疑蒸气的方向，推一下机器手柄上的样品键，握住喷嘴，知道LCD显示处理过程。

Vapours escape from rooms and other enclosed areas or containers through any available opening. Table 4-1 below indicates examples of specific areas where vapour samples should be taken.

蒸气从密封的间隙或者打开容器的时候散发出来。下面图表4-1表明某些特定地区或者方面须采用蒸气采样。

Table 4-1 Vapour Sampling Area Identification Guide

SUSPECT ARTICLE	SAMPLING AREAS
LUGGAGE	Zippers and seams
LARGE AREAS	Samples in large buildings can be taken at exhaust ventilation openings
VEHICLES	Edges of trunk, doors, and windows
BOXES	Box lid
ROOMS	Door cracks, windows, and vents
LARGE AIRCRAFT	Samples can be taken at air exchange ventilation openings
OUTDOORS	Take samples downwind of the suspect area or object

4.3 Particulate Sampling Background微粒取样背景

Explosives residues, particularly those of plastic explosives, tend to stick to surfaces. When a person touches an explosive some residue may stick to their hands, and each time they touch an object some of the residue may be transferred to it.
爆炸物残渣，特别是那些塑料爆炸物，倾向于黏住表面。当有人接触到爆炸物，一些残渣会黏住他们的手，这样子每次他们接触一个物品，一些残渣物就会从手里转移到物品上面去了。

Collecting samples for analysis requires the operator to think like a person trying to conceal explosives. The operator must consider where the person may have touched the suspect article. This applies to any container. The goal is to take samples from the most probable locations on the suspect containers that may have been contaminated (handels, zipper).
采集样品来分析要求操作者能够想象一个人试着隐藏爆炸物，操作者必须联想到这个人有可能会接触到那些可以物品。这适用于任何容器。目标是从受到污染的可疑的容器上面最有可能的地方取出样品。（手柄，喷嘴等等）

The E3500 can detect very small traces, but it is the operator's responsibility to introduce these traces (when present) by using the proper sampling technique.
E3500可以探测到非常小的痕迹，但是使用一个得当的抽样技术来介绍这些痕迹（当出现时）是操作者的责任。

4.4 Particulate Sampling Method微粒采样方法

Particulate samples are taken from suspect articles by wiping with a clean cotton glove or wiping with a sample screen. Each sampling method has advantages and disadvantages, however, wiping with a clean cotton glove is the preferred method. Using a sample screen is the second recommended method.
微粒采样是通过用一双干净的棉手套擦拭可以物品或者样品屏幕得到的。每一个采样方法都有利也有弊。然而，通过干净的棉手套来擦拭或者是一个比较可行的方法。使用样品屏幕是第二推荐的方法。

When using either of the two methods, it is very important that **all sampling of suspect articles be**

done with the operator wearing clean cotton gloves on both hands. The gloves must be discarded and a fresh pair put on whenever the gloves become soiled, the gloves show signs of deterioration, or a sample results in an alarm.
使用这两种方法中的任何一种，所有可疑物品上面的样品都必须由操作者双手佩戴干净的棉手套采集得到。一旦手套脏了就必须丢掉重新换上新的干净的。弄脏了的手套所采集到的样品都会被恶化，或者取样结果会附带警报。

It is not necessary to aggressively rub a surface to collect a sample. Sample screens and cotton gloves are designed to lift material off surfaces with gentle pressure so that damage to surfaces is minimized.
没有必要用蛮力擦拭屏幕收集样品，样品屏幕棉手套都是经过精心设计的，只需要轻轻扫就可以收集到样品，以免屏幕损坏。

NOTE: **For example, any amount of particulates large enough to be visible to the naked eye will overload the E3500.**
注意：例如：任何数量大到肉眼可以看到的微粒都将使E3500超负荷。

4.4.1 Glove Sampling 手套采样

The suspect article is wiped with a gloved finger. The material is then transferred to a clean sample screen by rubbing the gloved finger against the screen surface. The screen is then inserted into the **Injector Inlet** of the E3500, and an analysis cycle initiated.
用戴着棉手套的手指清扫可疑物品，把可以的微粒从屏幕表面扫到样品屏幕上。把屏幕插入E3500蒸气器进口，开始分析周期。

The glove sampling method produces the lowest rate of nuisance alarms, permits the setting of the lowest alarm thresholds, and is the least prone to interference from the operator's hands.
手套取样方法产生的警报滋扰最低，可以设置最低阀值，最大的减少伤害操作者的手的可能。

However, because particulates must be transferred from the glove to the screen, some could be lost in the process. If this happens, the amount deposited on the screen could be less than that required to initiate an alarm.
然而，由于微粒必须从手套转移到样品屏幕上，中间可能会有一些被遗失。如有这样的情况发生，那么最后到样品屏幕上的微粒数量就小于产生警报时所需数量。

Note: Using a clean cotton glove for sampling is currently recommended by Scintrex Trace Corp. Other sampling protocols have proven effective in special circumstances, and some institutional users have adopted alternate techniques. For more information on sampling techniques, contact Scintrex Trace Corp. or your local representative.

注:Scintrex Trace Corp.建议使用干净的棉手套来取样。其它抽样协议已被证明在特殊情况下有效，一些学会上的用户也已采取了其中的一种技术。想获取更多取样技术，可以联系Scintrex Trace Corp.

或者联系当地的代理商。

The position of the glove refers to how it is held while wiping suspected areas. The glove should be held firmly to minimize movement, to ensure that the area of the glove or wipe that contacted the suspect article remains fixed, and to ensure that the maximum amount of the sample is transferred to the screen.
手套的作用是在于如何擦拭可疑的地方以获取样品。手套在擦拭的时候必须在最小的范围内移动，确保手套的范围内或者所接触到的可疑物品上的最多的样品可以被收集到并且转移到样品屏幕上。

Apply a moderate amount of pressure when sampling, and in a circular wiping motion. The area of the glove that contacted the suspect article should be applied to the sample screen, to transfer the maximum possible amount of explosive.
在采样时应采用适当的压力，循环的擦拭可以物品表面，可疑物品上面手套接触到的地方，都应该用样品屏幕来转移尽可能多的炸药。

4.4.2 Direct Sampling with a Screen 直接用屏幕取样

This method of sampling is the most efficient, but the suspect article may be scratched or damaged when rubbed by the sample screen. Furthermore, the chances of picking up and introducing foreign particles and debris into the E3500 **Sample Screen Injector Inlet** is increased over the glove sampling technique.
这种取样方法,是最有效的,但是擦拭样品屏幕的时候可疑物品可能会受损。此外,得到或者引进国外微粒和残骸到E3500的样品屏幕蒸气器进口的机会就比手套取样的技术大的多。

Sampling screens require careful handling. Gently rub the surface and keep your fingers away from the metal mesh when handling screens.
样品屏幕必须小心处理，轻轻擦拭表面手指保持不碰到金属钢丝。

If a particulate sample screen is bent or frayed and cannot be restored, then it should be discarded. A bent or frayed screen may damage the E3500 when it is inserted into the Injector Inlet. It may also damage the surface being sampled.

如果微粒样品屏幕变形了或者受损了而不能修复的，则必须扔掉。变形或者受损的屏幕在插入蒸气器进口时会损坏E3500.设置损坏炸药微粒的表面。

4.5 Smart Sampling Area Identification智能识别采样区

Smart sampling area identification can be defined as: intelligent determination of those areas of a suspect article most likely to be contaminated with a target compound. In the case of baggage, these areas would logically be handles, latches, buttons, and exterior edges.
智能识别采样区可以被定义为：智能测定带有可疑物品并被目标化合物污染的范围、在行李箱里，这种范围一般就是手柄，对锁，纽扣，外部边缘等。

Table 4-2 Particulate Sampling Area Identification Guide

SUSPECT ARTICLE	SAMPLING AREAS
DOCUMENTS	Outer cover and inner pages
LUGGAGE	Zippers, handles, and latches
PHONES, RADIOS, COMPUTERS	Carrying handles, switches, knobs, keypads, and keyboards
VEHICLES	Doors, glovebox, trunk locks and handles, steering wheel, shift lever and radio controls
BOXES	Box lid
ROOMS	Door knobs, handles, and windows, locks
FURNITURE	Handles and armrests

SECTION 5 – TROUBLESHOOTING AND MAINTENANCE
第五部分--故障排除与维护

5.1 TROUBLESHOOTING发现并维修故障

At times, the E3500 may show symptoms of faults or errors. Table 5-1 lists potential problems and related troubleshooting procedures.

有时候E3500会出现一些错误或者故障的症状，图表5-1列出了一些潜在的问题和相关的维修方案。

问题	处理程序
装上电池后机器无法运行	1. 更换一个满电的电池 2. 确保电池安装妥当 3. 确保机器已经打开 4. 有需要时检查或者更换5Am的保险丝 5. 检查电池与电池之间的接触 6. 如果机器还是无法运行，可以联系Scintrex Trace Corp.客服中心
开启电源之后，LCD显示器没有任何显示	1. 更换一个满电的电池，或者连接外部电源 2. 检查5Am的保险丝，有必要的时候进行更换 3. 联系厂家获得技术服务支持
机器接通外部电源可以运行,但是装上电池就不可以	1. 电池没电了，更换一个满电的电池或者直接连接外部电源 2. 检查电池与电池之间的接触，必要时清理一下灰尘。或者电池的接触地方坏了。 3. 联系厂家获得技术服务支持
电池充不进电或者充电器无法进行充电	电池是一种能量消耗物，有一定的循环充电次数。安全处理好镍镉电池之后从厂家处获取新的电池
泵的检修方法	
机器开启之后空气泵不启动	1. 先关闭然后再开启机器 2. 联系厂家获得技术服务支持
空气泵运行了,但是机器对样品检测并不响应	1. 蒸气取样模式时，启动样品循环，把一个手指放在喷嘴处，在喷嘴处来回移动，在取样周期，喷嘴如果收到阻塞会发出另一种声音，这声音表示泵正在吸入空气，引起了空气流。 2. 断开整流罩，检查9寸打头阵连接器是否安全插上插头连接了电源 3. 把插头插紧 4. 确保管没有松开或者断开，不要用蛮力移动管道
PMT输出高	1. 大气中有大量的氧化剂，例如氧化氮等氧化物 2. 旧的E3500传感器（在室温下存储
E3500故障排除	
机器被爆炸物残渣污染	1. 把E3500移到一个干净的地方 2. 如果机器在微粒模式中受污，移开微粒屏幕 3. 启动样品周期，注意数值 4. 如果数值依然太高，再重复，直到数值降到开始时一样。 5. 如果数值一直不降，联系厂家获得技术服务支持。

5.2 Maintenance维修

Effective operation of the E3500 depends on regular maintenance.
E3500可否有效运行取决于定期的维护。

5.2.1 Decontamination of Sample Screens样品屏幕的排污

Screens with visible dirt accumulation should be discarded or cleaned. Dirt reduces the collection and desorption efficiency of the screen. A dirty sampling screen should be thoroughly cleaned with soap and water, and then rinsed in acetone or a similar solvent. The screen should then be thoroughly air-dried (if possible heat dried) before being re-inserted into the E3500. If a particulate sampling screen is bent or frayed and cannot be restored, it should be discarded. Bent or frayed screens may damage the E3500 and the surface being sampled.
屏幕上有明显的污垢积聚应当抛弃或清洁。灰尘会使屏幕收集和吸附样品的功能受影响。一个弄脏了的抽样屏幕在插入到E3500中应该先用肥皂和清水洗干净然后在丙酮或类似的溶剂中冲洗。接着风干(如果可能的话)如果微粒取样屏幕弯曲或损坏了,无法修复,应该扔掉。弯曲或磨损的屏幕可能损坏E3500以及爆炸物的表面。

5.2.2 Replacing the 5-amp Fuse 更换5-amp保险丝

Unscrew the fuse holder cover on the rear panel by turning counterclockwise. Carefully remove the fuse and inspect it. If it requires replacement, install one of the fuses supplied with your unit (stored in your case). Re-install the fuse holder in the rear panel.
反时针方向松开后面板上面的保险盒，小心移动保险丝并进行检查。如果需要更换，安装一根出厂附带的保险丝（在箱子里面），重新把保险盒安装好。

5.2.3 Recovering from Severe Contamination从严重的污染中修复

The following components of the E3500 could be adversely affected by severe contamination:
下列的E3500零部件很有可能被影响到：
■The vapour inlet nozzle and its components, 蒸气进口喷嘴及其零部件
■The vapour and particulate sample tubes, 蒸气和微粒样品管道
■The internal tubing, 内部管道
■The three-way solenoid valve, 三向电磁阀
■The particulate screen desorber assembly, 组装的微粒吸附屏幕
■The carrier pump. 运送泵

Severe contamination can occur in both vapour sampling and particulate sampling modes. If this occurs, the nose cone assembly of the unit must be either cleaned or replaced. If these procedures do not work, contact Scintrex Trace Corp Technical Service Support.
蒸气取样模式和微粒取样模式都有可能受严重的污染。如果这种情况发生，机器组装的整流罩必须弄干净或者更换掉。如果之后还不能正常工作的话，可以联系Scintrex Trace Corp的技术服务部。

5.2.4 Vapour Contamination蒸气污染

In most cases of an overload condition, two or three blank sample cycles will usually cleanse the E3500 of any residual explosives vapours. A blank sample cycle is one in which no actual sample is taken. The blank samples should be taken away from the location where the sample that caused the overload was taken. **If a series of blank cycles fail to clear the contamination, refurbish the**

vapour inlet assembly.
大多数超负荷的情况下，两三个空白样品周期都可以净化E3500的炸药蒸气残渣。空白样品周期是一种没有实际样品检验。空白样品应该远离使得E3500超负荷的样品存在的地方。

5.2.5 Refurbishing Vapour Inlet Assembly修复组装的蒸气进口

The vapour inlet assembly is refurbished by removing the steel screw nut from the front of the vapour inlet nozzle then removing the vapour sample collector tube from its housing and cleaning the inside of the steel screw nut, the O-ring, and the steel mesh screen. Contamination may mainly occur at the Steel mesh screen or the Vapour trap (see figure 5-1).
组装的蒸气进口可以通过拆开蒸气进口前面的钢化螺丝帽来，然后从外壳上拆开蒸气样品收集管道来清洗里面的钢化螺丝帽、O型网以及钢网筛来翻新。污染主要发生在钢网筛和蒸气捕集器。

Install a new vapour sample collector tube (Vapour desorber + Vapourtrap + Vapour Pyrolyzer) and reassemble the vapour inlet assembly. Turn on the E3500 and wait until it enters **READY** mode. Perform three blank sample cycles.
安装一个新的蒸气样品收集管道（蒸气吸入器+蒸气捕集器+蒸气热解器）和重新装配一个组装的蒸气进口。打开E3500等待其进入自检模式，完成三个空白样品周期。

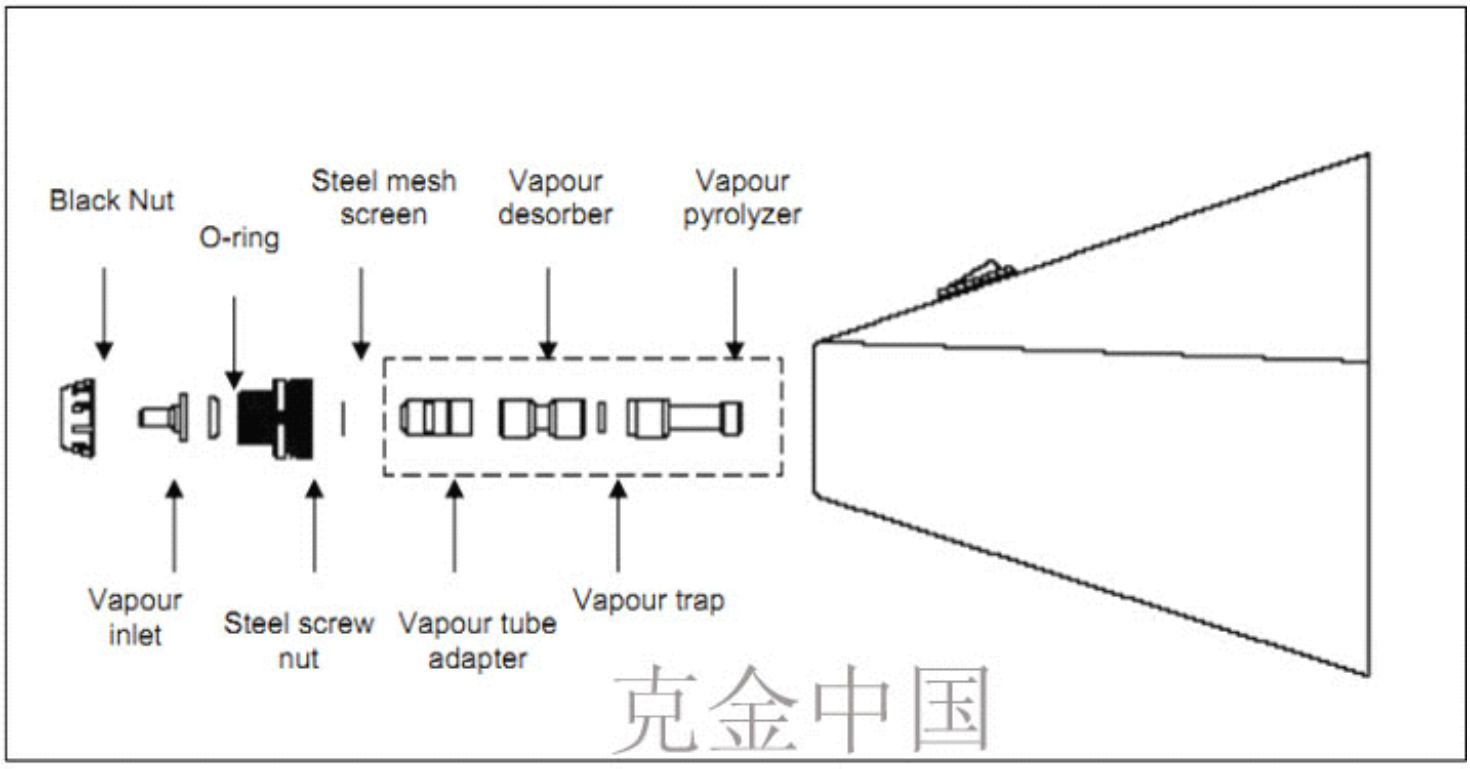

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Figure 5-1 Vapour Inlet Assembly

5.2.6 Particulate Contamination微粒污染

The most common contamination in the particulate sampling mode is in the screen desorber. Performing a series of blank sample cycles without a sample screen in the injector inlet should cleanse the screen desorber of contamination. If this fails, replace the particulate sample tube collector.

最常见的微粒取样模式污染就是在屏幕吸入器。在完成一系列空白样品周期时候，样品屏幕并没有插入到蒸气器进口，屏幕吸入器有可能被净化了。如果这种情况没有奏效，就要更换微粒样品收集管道。

5.2.7 Replacing Particulate Pyrolyzer 更换微粒热解器

The particulate pyrolyzer tube is replaced by first removing the nose cone assembly from the E3500. Remove the protective casing from the particulate sample tube collector housing. Remove the teflon tubing from the housing. Open the case that holds the particulate pyrolyzer tube shown in figure 5-2. Then insert a new particulate sample tube collector in the housing and reinstall the tube collector. Re-install the nose cone assembly. Turn on the E3500. When the E3500 enters **READY** mode, perform three blank sample cycles.

首先拆卸E3500的整流罩装配更换微粒热解器，从微粒样品管道外壳移开保护套管。打开接住微粒热解气管道的盒子，如图5-2所示。再把整流罩装配装上，打开E3500，当E3500进入自检模式后就可以完成三个空白样品周期。

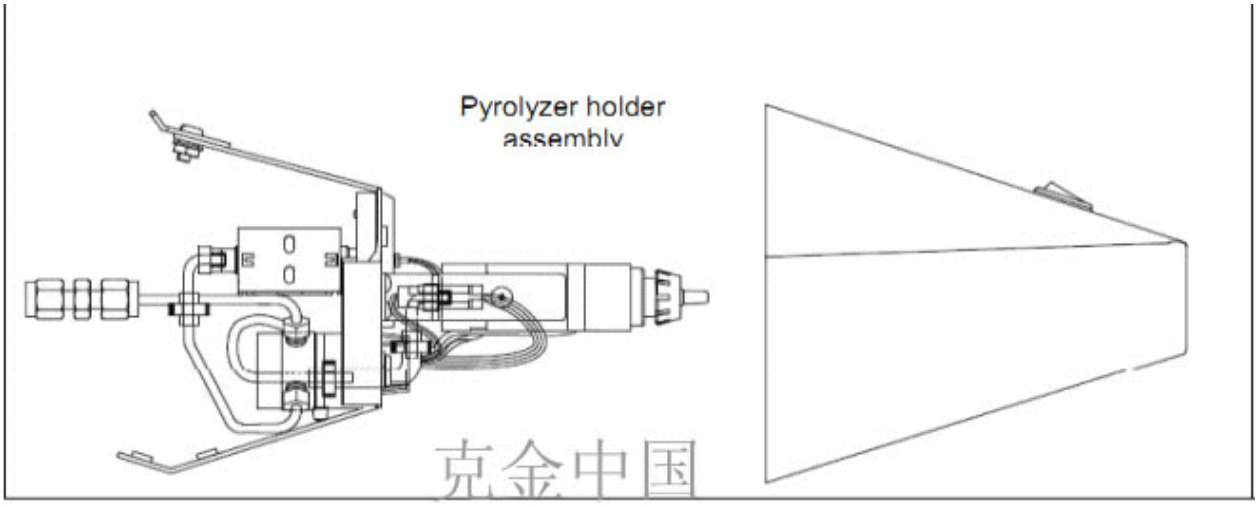


Figure 5-2 Particulate Pyrolyzer Tube Replacement

5.4 Return of Goods for Repair or Disposal退回来的货物的维修和处置

The E3500 or any of its parts may be returned to Scintrex Trace Corp for repair or disposal. Shipping of a complete unit or parts requires special handling.

E3500或其任何零部件都可以退回Scintrex Trace Corp维修或处理。整套货物或者其零部件在运输过程中需要特殊处理。

Pack the unit in its original factory shipping crate. Parts must be well packed and protected against any possible damage they may be exposed to during shipping. Contact Scintrex Trace Corp. to order a replacement shipping crate if required.

把机器装到元出厂的包装箱里面，零部件必须妥当包装保管以防止任何在运输过程中所引起的损坏。如有需要可以联系Scintrex Trace Corp订购更换的运输箱。

Disconnect battery and remove E3500 Sensor from E3500 prior to shipping. Protect battery terminals from electrical short circuit to prevent fire or personal injury.

装运前应断开电池，把传感器从E3500上面取下来。以免电池短路而引起的事故。

Contact Scintrex Trace Corp to coordinate shipping details such as customs and other documentation required, pickup times, and required signatures for insurance purposes.

联系Scintrex Trace Corp来协调一些运输的细节，比如海关，其他要求的文件资料，装运时间，签署保险合同。

After all shipping arrangements have been made and confirmed with Scintrex Trace Corp., all returned goods should be shipped to the following address or a DDU (Delivery Duty Unpaid) service from outside Canada.

所有运输安排完成以及跟Scintrex Trace Corp.确认之后，所有返回的货物都应该寄到以下地址或者加拿大地区之外的地方都必须采用DDU。

Scintrex Trace Corp.
Technical Service Department

300 Parkdale Avenue
Ottawa, Ontario K1Y 1G2
CANADA

5.5 Handling and Storage of E3500 SensorsE3500传感器的处理和贮藏

New E3500 Sensors should be stored in a refrigerator. This simple procedure will extend the life of the sensor.
新的E3500传感器必须贮藏在冷藏库，这一简单的处理过程可以延长传感器的使用寿命。

Used E3500 Sensors should be stored in a plastic bag (Ziploc® or equivalent).
使用过的E3500传感器必须装进塑料袋里面。

Used E3500 Sensors cannot be discarded unless the contents are chemically neutralized. Care should be exercised during the procedure to prevent skin contact or contact of the contents with sensitive surfaces. Latex or vinyl gloves and protective glasses should be worn. Should skin contact or spillage occur flush immediately with water or a dilute solution of vinegar.
使用过的E3500传感器不能丢弃除非传感器上面的化学成分都被中和了。在处理传感器时应该小心谨慎，以免皮肤接触到传感器或者接触到表面的敏感部分。应该佩戴乳胶或者乙烯基手套，一接触到皮肤或者有泄露现象必须马上用清水或者用稀释的醋进行清洗。

5.5.1 Neutralization Method中和方法

Equipment 设备

■One liter glass bowl一升的玻璃碗
■Household vinegar家用醋
■Sharp knife or tool for puncturing E3500 Sensor membrane锋利的刀子或者工具来刺穿E3500传感器上面的薄膜

Process 处理过程

■Carefully puncture the sensor membrane located on the top of the sensor with a sharp knife用一把锋利的刀小心的把传感器上面的博美刺穿
■Immerse the sensor in a liter of water (in a bowl)把传感器浸泡在一升水中（在碗里）
■Add some household vinegar加入一些家用醋
■Pour the solution down the drain and flush with water把溶液倒进排水管流进水里
■Discard the empty container把空的容器扔掉

APPENDIX A – E3500 BATTERY
附录A-E3500电池

How to Charge the NiMH Battery Using the Scintrex Trace Corp Universal Battery Charger (PN D100550)
如何使用Scintrex Trace Corp通用电池充电器（PND100550)对镍氢电池充电呢？

Use the Universal Battery Charger PN D100550 with the recommended Scintrex Trace Corp NiMH battery. Charging a battery other than the recommended battery provided may cause irreparable damage to the incompatible battery and/or the charger. Recharge batteries at ambient temperatures of 18°C to 24°C.

使用通用的电池充电器（PN D100550）对Scintrex Trace Corp推荐的镍氢电池充电。使用提供的推荐的电池之外的其他不相容的电池/充电器，有可能会引起不能修补的损坏。充电于常温下18° C到24° C。

Connect the Universal Battery Charger to a compatible AC outlet which provides a ground connection for safe operation. The Universal Battery Charger is designed to operate within the voltage range indicated on the label affixed to the charger.

连接一个通用电池充电器到兼容交流输出插座中,插座提供了一个接地安全操作。通用电池充电器操作的电压应在贴在充电器上面的标签范围内。

Activate the Universal Battery Charger by switching to the appropriate “POWER ON” indication. The red power lamp should be lit. The green charge state lamp should be lit prior to installing a discharged battery.

通过切换到“POWER ON”指示灯，开启通电电池充电器。此时红色灯发亮， 绿灯电荷指示灯在安装一个放点电池之前发亮。

Inspect the battery for any damage prior to connecting it to the charger. If any physical damage to the battery is apparent do not attempt to charge it. Obtain a replacement battery.

电池连接到充电器前检查一下有无任何损坏。如果显然的有任何的有形损坏，不要强行进行充电，重新更换一个电池。

After connecting the battery to the charger the red power lamp should remain lit and the green mode lamp should change colour to orange while the charging is in progress the mode lamp should change back to green when the charging process has been completed (about one hour). If the red lamp and the green lamp both extinguish and the fan stops, this may indicate a battery which has defective cells and can no longer be safely charged. Obtain a replacement. When the mode lamp changes to green, after about an hour the battery is normally charged and is safe to use. Although this is a multistage type charger, it is good practice not to leave the battery connected for longer than one hour as the battery may be damaged.

电池连接到充电器后，红色灯应保持亮，充电时，绿灯转变为橙色，当充电完成时（大约一小时），模式等又转为绿色。如果红色灯和绿色灯都熄灭和风机停止时,这可能表明了一种电池具有缺陷细胞和不再能被安全地充电。应更换另一个新的电池。当模式灯变成绿色，约一小时后电池通常是充满的，可以安全使用的。尽管这是一个多级式充电器,最好还是不要让电池在充电器上面停留超过一小时，这有可能会损坏电池。

If a battery quickly heats up during the charging process, it may no longer charge properly and needs to be replaced. A temperature sensor in the battery will disconnect it in such an event. Disconnect and remove the defective battery. If the battery does not hold a charge above 13V for the normal expected time this also indicates a replacement battery may be necessary. The battery is a consumable device and has a limited number of recharge cycles. To avoid loss of run time or unexpected battery failure, replace batteries every two years.

如果在充电过程中电池快速变热，则不能继续正常充电，而应更换一个。电池里面的温度传感器在这种情况下将会断开，断开同时取走电池。如果电池不能保持在高于13V的电荷正常状态下充电，这也表明了必须更换电池。电池是一种消耗设备，存在一定的循环充电限制。为了避免运行时间的减少或者意外的电池损坏的最好每两年更换一次电池。

APPENDIX A 附录A

The battery charger should be switched to the off position when not in use to extend the life of the built in cooling fan.

当电池没有使用时，电池充电器应该转为关闭状态，冷却风扇以便延长电池的使用寿命。

LED Function of Charger充电器上面的LED灯的功能

LED WILL ILLUMINATE TO INDICATE STATUS OF CHARGER AND BATTERY			
LED 1	Red	=	Power ON
LED 2	Orange	=	Charging
LED 2	Green	=	Full Charge

充电器和电池上的LED将会发亮显示以下情况	
LED1	红色=开启
LED2	橙色=充电
LED3	绿色=充满

APPENDIX B – COMMUNICATIONS
目录B--通信设备

Communications通信设备

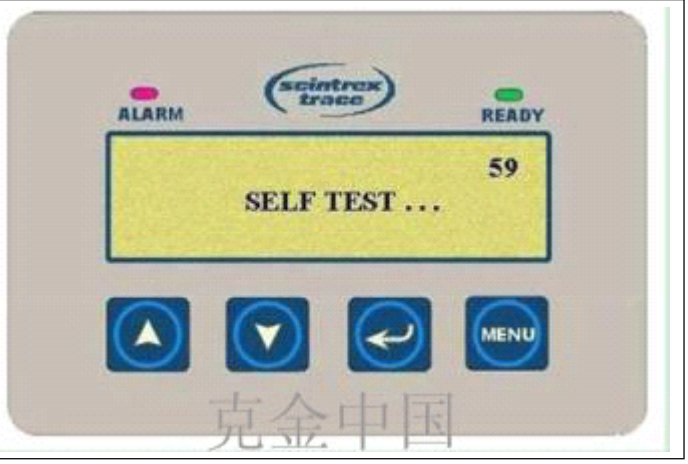
There are a number of techniques that can be used to communicate with the E3500. Hyper-Terminal, LabView, Internet Browsers and Pocket PCs are all able to communicate with the E3500.

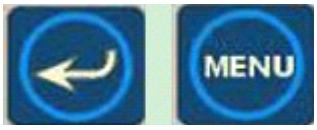
跟E3500进行通信有若干技术，Hyper-Terminal，虚拟仪器，互联网浏览器以及袖珍电脑都可以连到E3500.

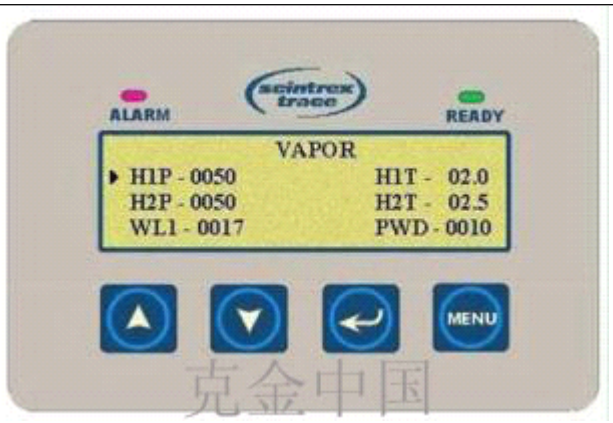
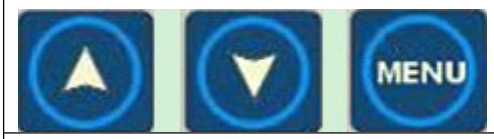
Embedded Software嵌入式软件

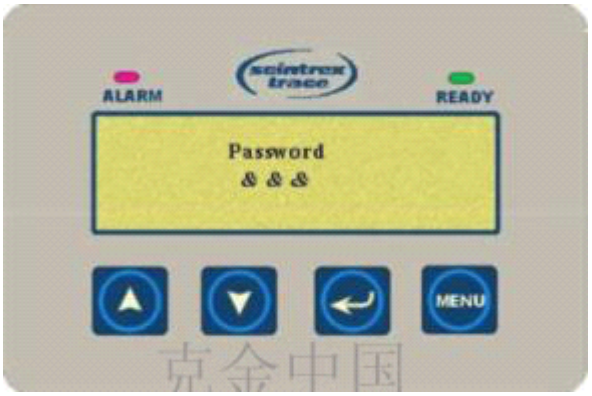
The E3500 has several frames that the user can browse through to view results, operational parameters or settings. The user can navigate through these frames by pressing onto the keypad located at the bottom of the LCD.

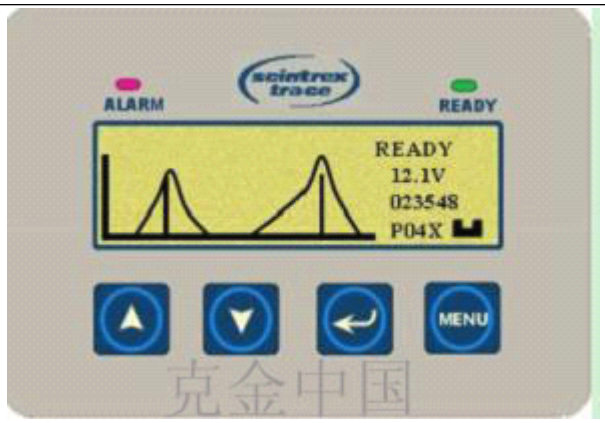
E3500用户可以通过多窗口画面来浏览结果，操作参数或者设置。用户可以通过按LCD下面的按键来做操这些窗口。

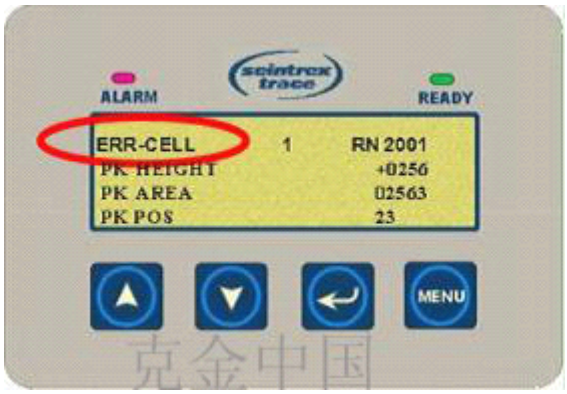
初始化屏幕 机器开始的第一个屏幕	
自检屏幕 自检模式（微粒模式时确保没有样品屏幕插到注射器进口中）	

文本窗口 每次自检模式之后，以下的屏幕都会出现，这个屏幕会显示出校正值。按一下MENU键可以转换到数值图表 	
图解屏幕 结果用图解表示法显示：按一下UP和DOWN箭头，用户可以放大或者缩小图表，变焦程度会显示在屏幕右下方角落。用户通过按MENU键可以回到文本屏幕。 	
观察参数屏幕1 从文本屏幕或者图表屏幕中按一下ENTER按钮，再按一下ENTER就可以观察参数 按一下MENU就可以退出这个屏幕 	
观察参数屏幕2 选择UP和DOWN按键看那些需要观察的参数，按ENTER就可以观察 按MENU可以回到上一个屏幕中 	

观察蒸气模式参数屏幕1 H1P：蒸气解吸器工作周期 （0-100） H2P：蒸气热解器工作周期 （0-100） WL1：锋位置的参考点 （0-80） H1T：蒸气解吸器持续的时间 （0-6秒） H2T：蒸气热解器持续的时间 （0-6秒） PWD：计算峰面积的峰宽 （0-20） 按MENU退出或者按UP和DOWN进入下一个屏幕 	
观察蒸气模式参数屏幕2 ST：取样时间 （5-15秒） THH：峰高的阀值 （0-99990） THA：峰面积的阀值 （0-99990） 按MENU退出或者按UP和DOWN进入下一个屏幕 	
观察微粒模式参数屏幕1 H1P：微粒解吸器工作周期 （0-100） H2P：微粒热解器工作周期 （0-100） WL1：锋位置的参考点 （0-80） H1T：微粒解吸器持续的时间 （0-6秒） H2T：微粒热解器持续的时间 （0-6秒） PWD：计算峰面积的峰宽 （0-20） 按MENU退出或者按UP和DOWN进入下一个屏幕 	
观察微粒模式参数屏幕2 THH：峰高的阀值 （0-99990） THA：峰面积的阀值 （0-99990） 按MENU退出或者按UP和DOWN进入下一个屏幕 	

编辑参数屏幕1 使用UP和DOWN，然后按ENTER键选择编辑参数 按MENU键可以返回上一个屏幕 	
编辑参数屏幕2 机器会提醒用户输入密码，使用键盘输入正确的密码 	
编辑参数屏幕1 一旦正确的密码输入了，会出现以下屏幕，选择RESET键清除记录 按MENU键可返回前一个屏幕 	
编辑参数屏幕2 选择RESET键后，会出现以下窗口 选择YES可以重置缓冲储存器	

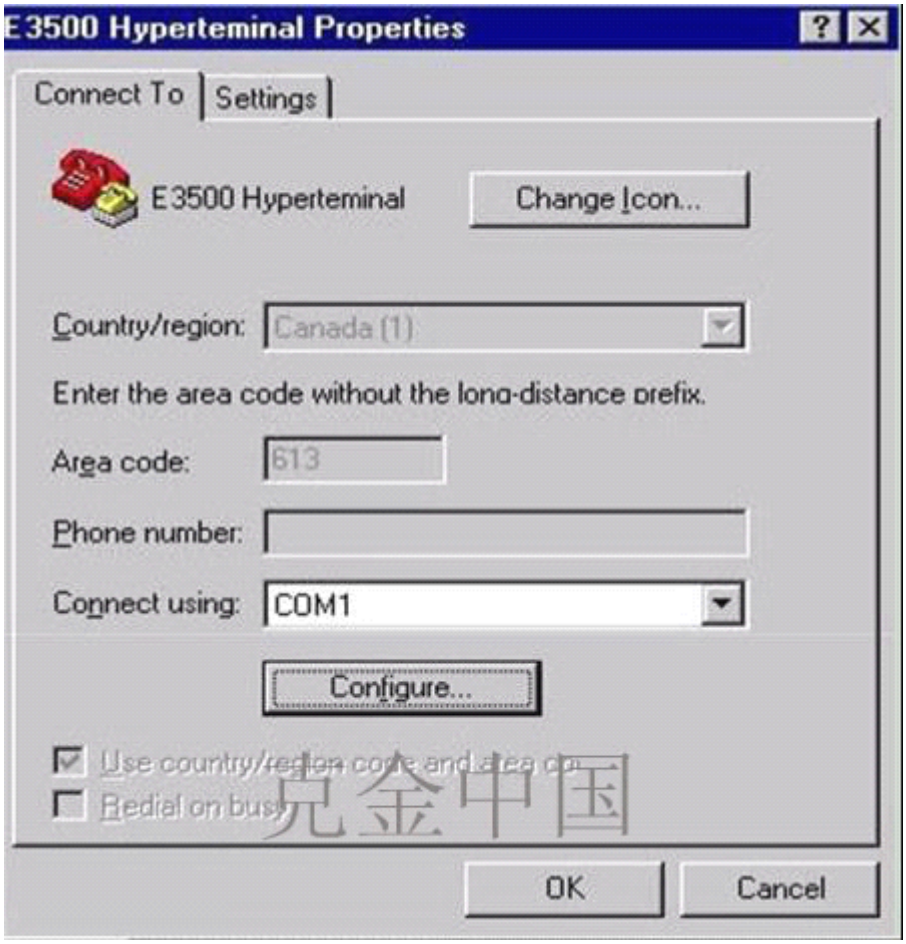
LCD上信息显示电池电量低	 如果电池指示灯闪烁，机器仍可继续工作30分钟 如果电池指示器显示数值低于11.5V，机器不能继续使用，显示面板自动转到文本窗口 更换一个满电的电池 对拆卸下来的电池进行充电
LCD上面显示E3500传感器出现错误	 如果发光氨示意（ ）表示闪烁，机器可继续使用1-2天 如果发光氨示意（ ）表示稳定，机器仍可使用直到发光氨的弹药筒更换

ERR-CELL	 如果RN值等于2000 如果从上次使用发光氨隔底匣到现在使用的时间超过1个月。
ERR-PMT-D	 清除机器临边上的隔底匣和们的信息

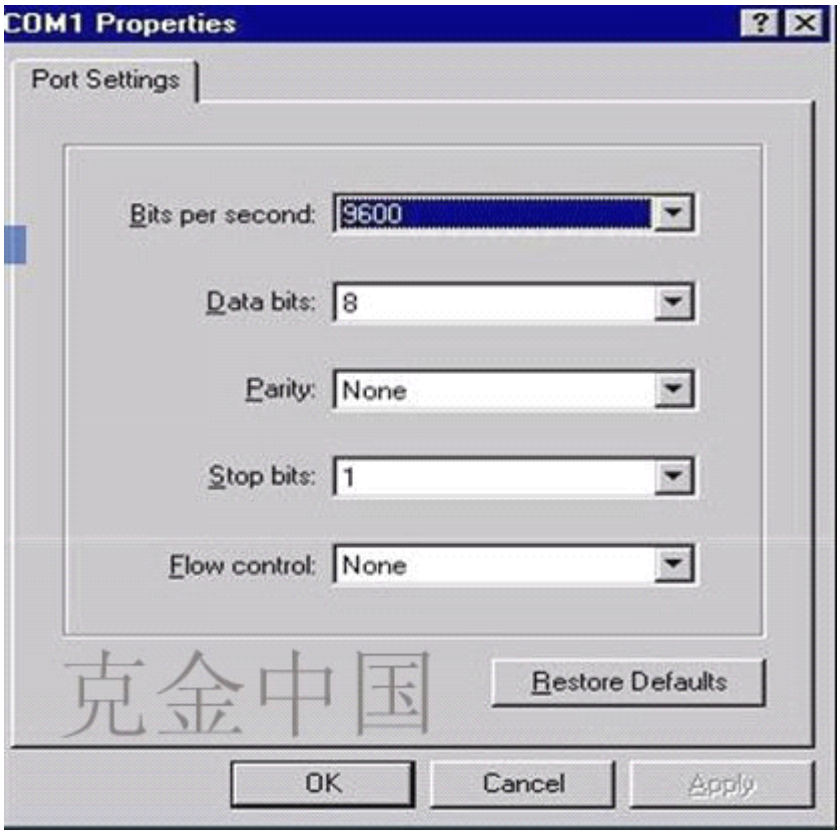
Hyperterminal Communication终端程序通信

Hyperterminal is a program that is available on most PCs. Connect the E3500 to the PC using the RS-232 cable provided. Once HyperTerminal has opened, create a new connection called E3500 (or any other such name that is desired). Setup the connection using the settings found in the figures below and then turn on the E3500 and allow it to go through its warming cycle.

终端程序是一种可以适用于大多数电脑的程序。 使用提供的RS-232电缆将E3500连接到PC上。 一旦终端程序运行，一个称为E3500的新的连接就会产生。(或者其他理想的名称）使用下面找到的数据来设置连接，然后打开E3500使其完成加热周期。

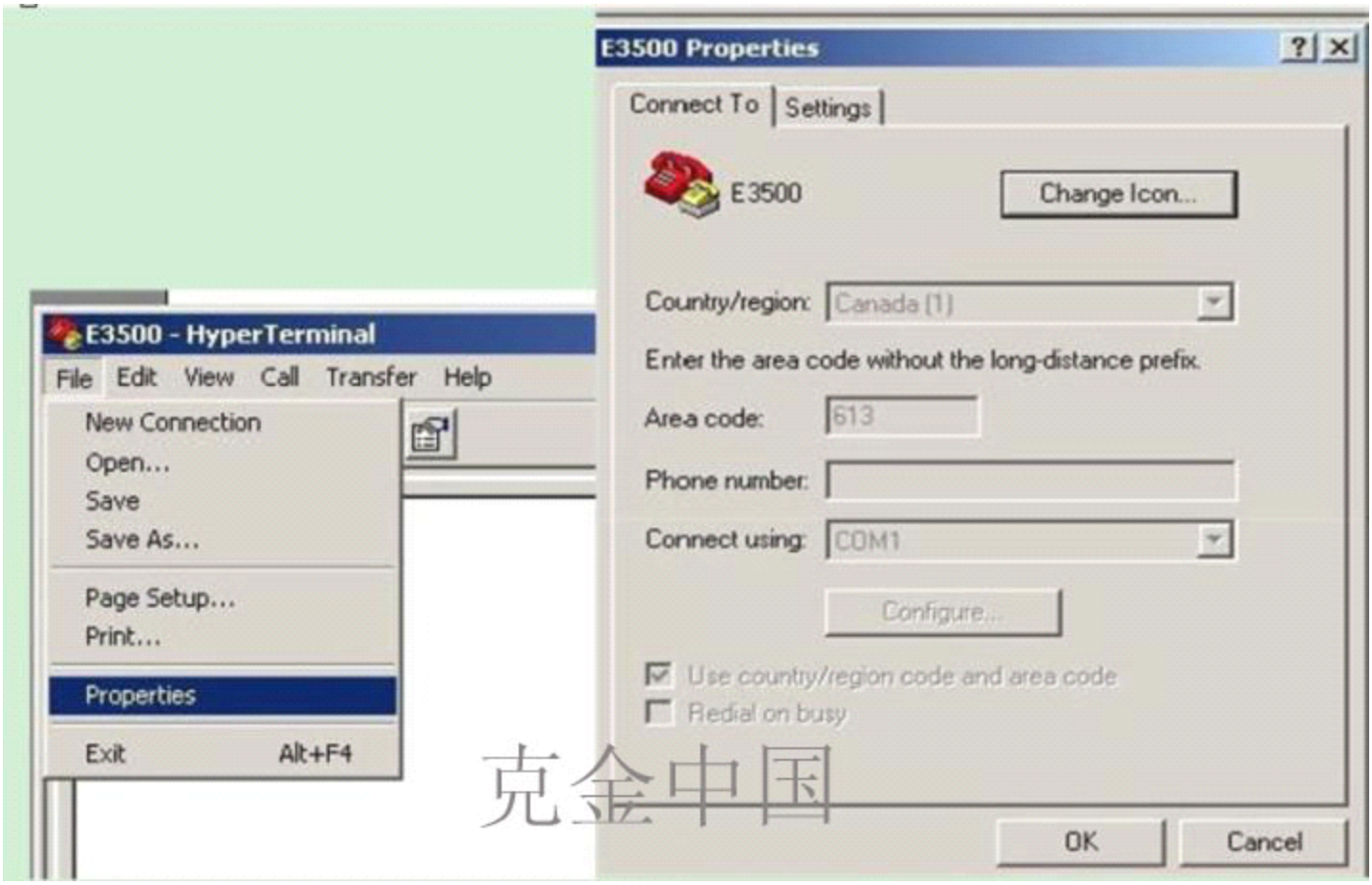

E3500 Hyperteminal Properties
Connect To
Settings
E3500 Hyperteminal
Change Icon...
Country/region:
Canada (1)
Enter the area code without the long-distance prefix.
Area code:
613
Phone number:
Connect using:
COM1
Configure...
Use country/region code and area co
Redial on busy
克金中国
OK
Cancel

点击设置标签，调整参数

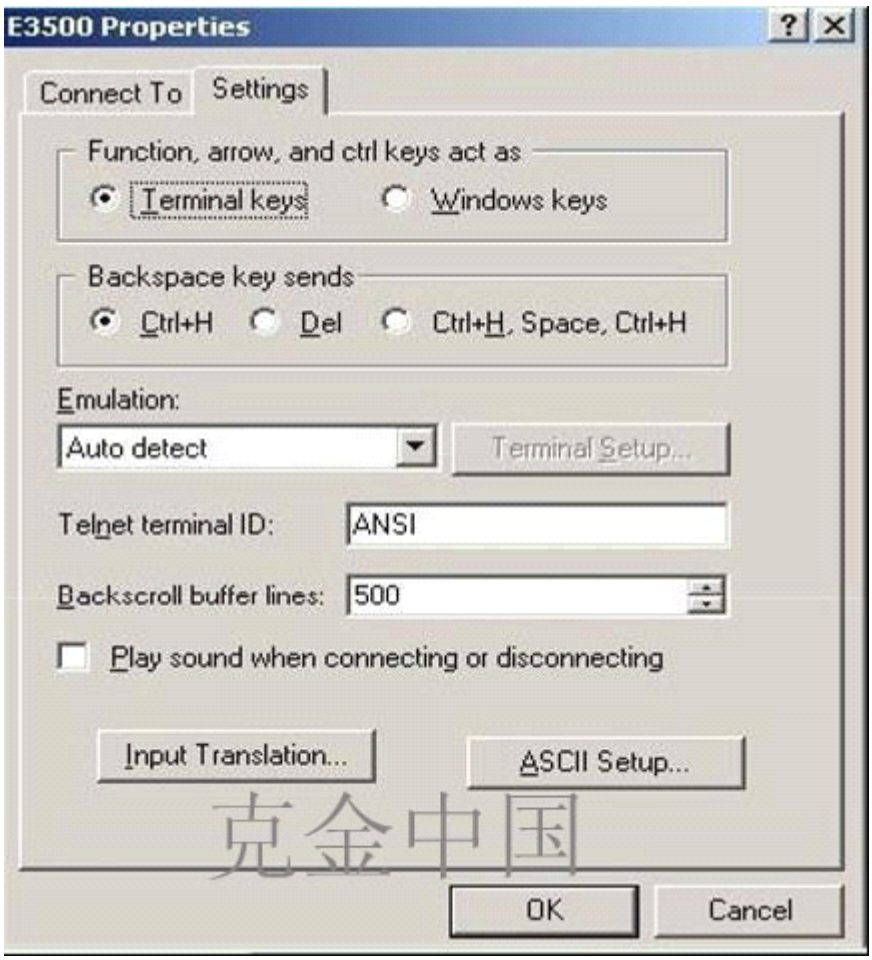

COM1 Properties
Port Settings
Bits per second:
9600
Data bits:
8
Parity:
None
Stop bits:
1
Flow control:
None
克金中国
Restore Defaults
OK
Cancel
Apply

Once Hyperterminal has opened the connection, there a number of commands which can be sent to communicate with the E3500. In order to send the commands, there are a number of options must be changed (in HyperTerminal) from the factory default settings. Under the File menu, choose the Properties selection.

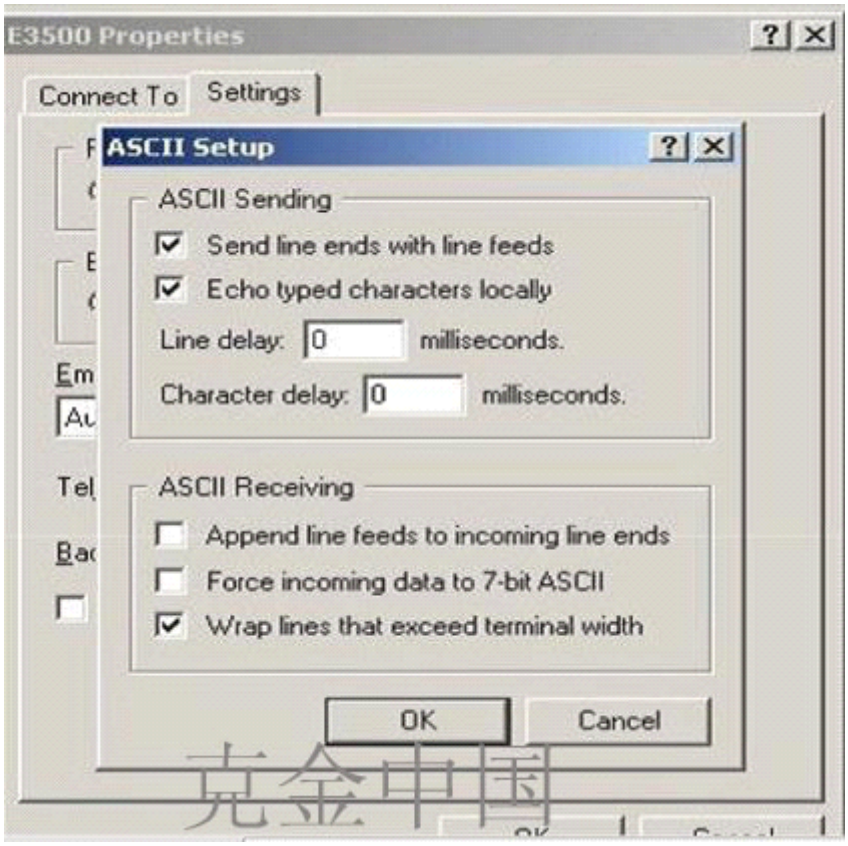
一旦终端程序打开连接，一些指令就会被发出来通讯E3500，为了发出这些指令，若干的工厂默认设置选择必须更改（在终端程序中），在文档菜单下面，选择性能选择。



一旦这个窗口被打开，选择设置标签。



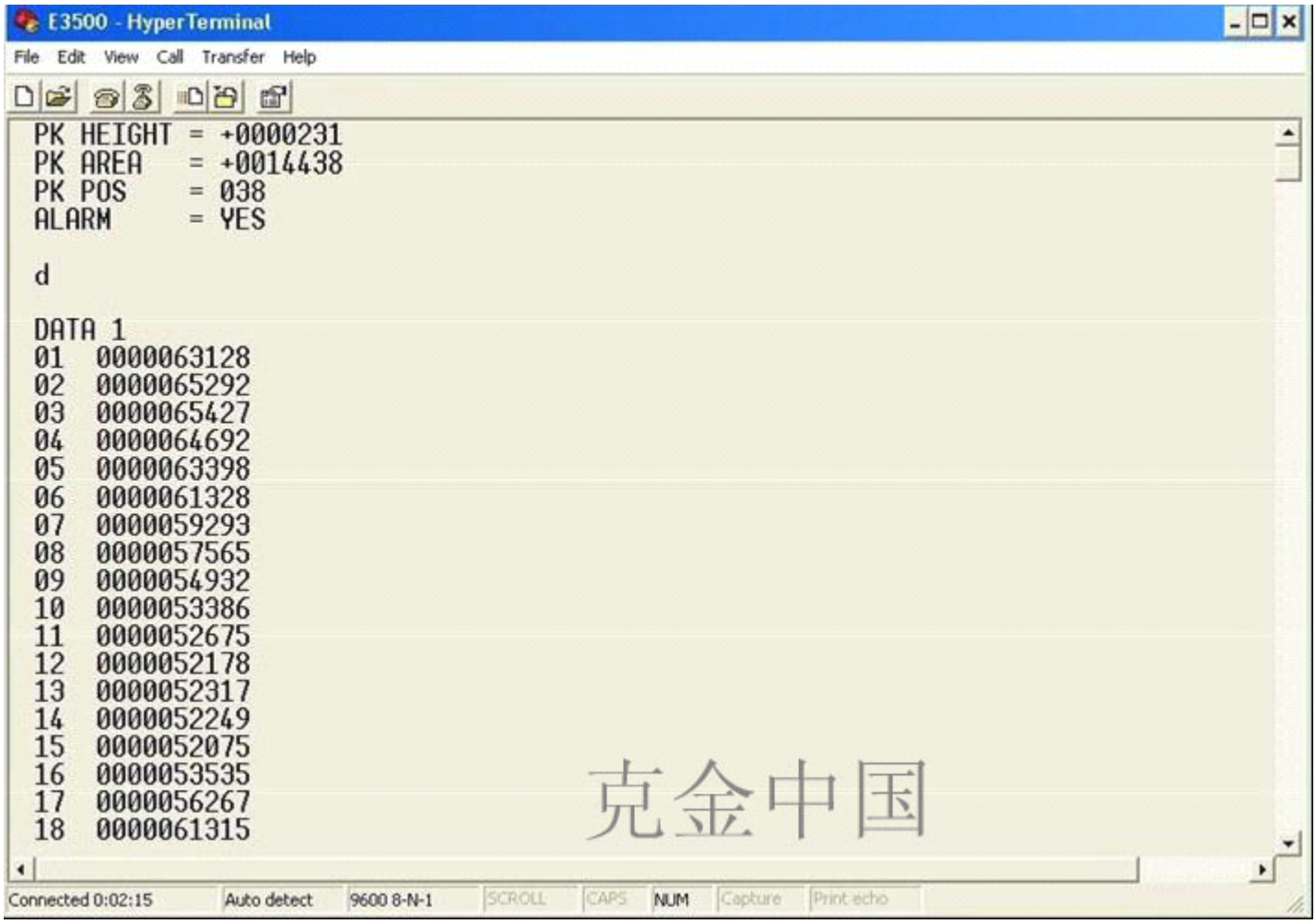
接下来，选择ACSII设置按钮



Once completed, click OK to leave the ASCII Setup window, and then OK once more to leave the Properties window. To save the settings, choose File->Save As and choose a filename/location under which to save the file. The next time the settings are required, File-> Load and choose the appropriate file.
一旦完成，点击OK离开ASCII设置窗口，然后再次点击OK离开性能窗口。选择File-Save As/选择文件下面的Filename/Location来保存设置。下次要求设置，则通过File-Location来选择正确文档。

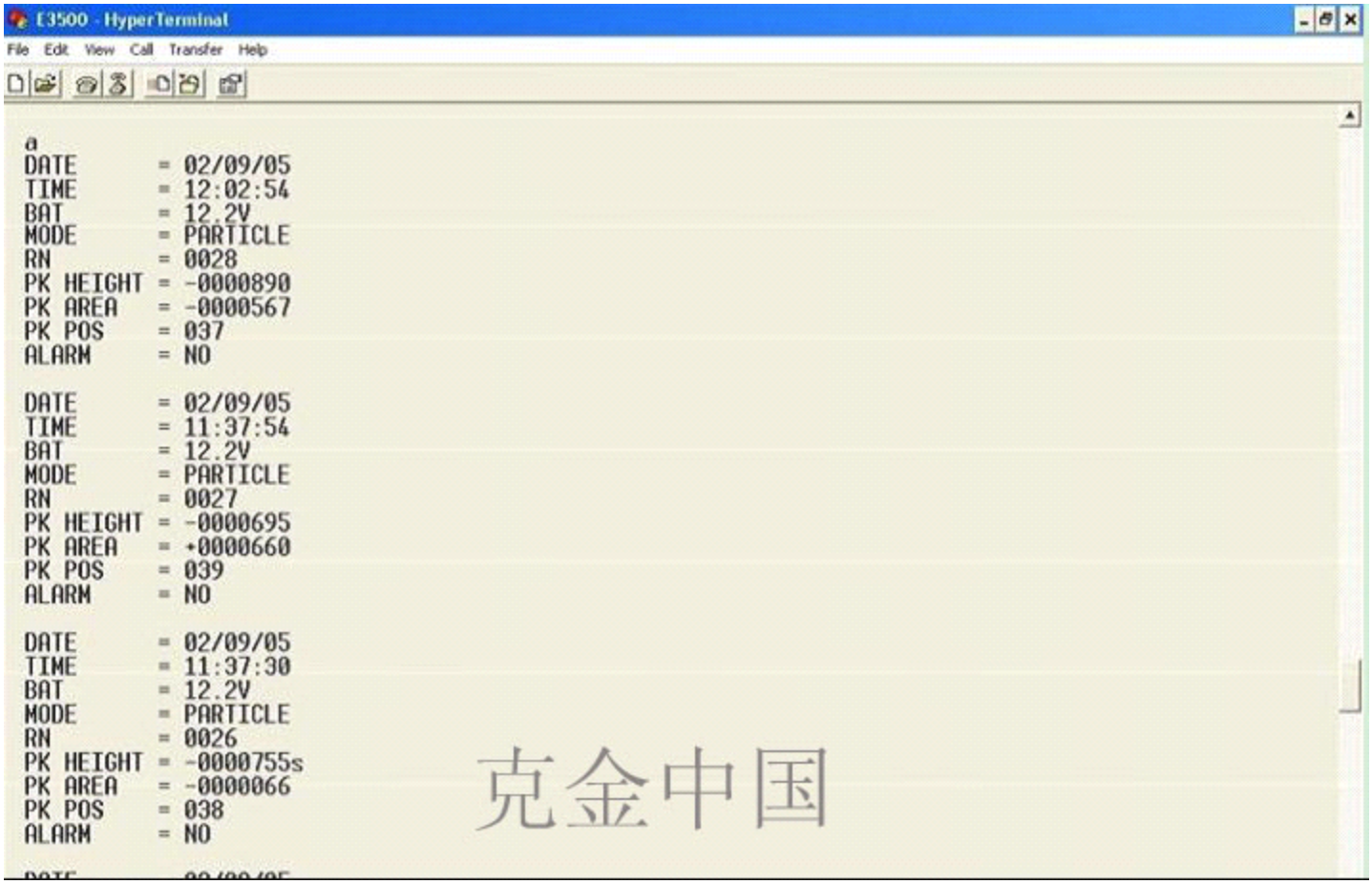
To start an analysis, type **1**. The E3500 will start sampling, and the following data will appear in the HyperTerminal window. This data can be displayed again by pressing **L**.
开始一个分析周期，打入1，E3500便会开始取样，接下来的数据就会显示在终端程序窗口，这个数据可能通过按L再次显示出来。

If more detail on the run is desired, the entire set of data points used to create the graph shown on the primary display can be obtained by entering **d** (or **D**) in the HyperTerminal window.
如果有更多的细节在运行,需要整个数据点用来创建图上显示在主分区，可以通过进入d(或D)在终端程序窗口获得。



The user can also download all the results stored (**895 samples**) in the memory by pressing **A and Enter**. To stop the process type **S and Enter.**

用户也可以通过按A进入下载所有储存在内存卡（895种样品）上面的结果。按S进入可以停止程序。



To retrieve the parameters for both modes type **P**, the following window will appear:
按P可以检索两种模式的参数，下面的窗口会出现。

E3500 - HyperTerminal
File Edit View Call Transfer Help
p
VAPOR PARTICLE
HT 02.0 01.5 02.5 02.5
HP 0040 0040 0070 0075
WL 0025 0020 0025 0010
TH 01000 00500 01000 02000
ST 10.0
克金中国

APPENDIX C--SPECIFICATIONS
目录C--详细规格

电学的	
电压	Scintrex Trace Corp 提供的12V直流电，可充电电池 可选的12伏直流电外部的电池 可选的外部AC电源
额定电流	5 Am
保险丝类型与等级	5 Am
力学的	
重量	3kg （6.6磅）
大小 （长*宽*高）	51 x 11 x 14 cm 20 x 4.3 x 5.5 in
运输重量	15.5-16kg （装箱重量）
运输尺寸(L x W x H)	57 x 26 x 39 (cm) 22 x 10 x 15 (in)
环境	
温度	E3500应在温度范围为-10℃--55℃（23°F -- 131°F）内操作。在5℃--65℃（32°F--149°F)的温度下储存
湿度	90%（不冷凝），任何情况下都不要是机器裸露或者改变使其冷凝的条件
通风设备	E3500上面的通风孔可以消耗在操作过程中所产生的热量，不要把机器放在任何阻碍通风孔透气的地方。防止周围的空气流通设备可能导致过热,可能会损坏设备或者使其可靠性降低。提供足够的通风和缓解间隙的操作以实现最优化性能。
一般的规格	
检测系统	化学发光
取样方法	蒸气以及微粒取样
热身时间	经常使用，1分钟
取样时间	5-15秒（用户可自己选择）
分析时间	少于10秒
灵敏度	PPB Level-Vapours / Nanograms - Particulates
可检的复合物	AN, C4, Detasheet, HMX, SEMTEX, Primacord, Tetryl, BTTN, TEGDN, TMETN, HNS, ETN, R-salt, Picric Acid, 4-ATN, DHT, ONTA, NQ, CL-20, ASA, 3NT, DAAT, TATP, HMTD, Urea nitrate,TNT, B黑色粉末，包括ICAO爆炸物示踪剂 (DMNB, EGDN, o-MNT, p-MNT), H2O2.
探测指示器	LCD显示报警 红灯亮 音响调节 声音报警
选择	12伏直流电外部电池 外部AC电源 外部的电池充电器 更换整流罩装置 棉手套(pkg. 抽样的20)

	4英寸的探针 软质探针 氯丁橡胶盖(D1000009) 通用以太网组件(D1000520) 通用无线工具包(D1000515) 通用打印机组件(D1000500)
数据记录存储	RS-232终端进行数据传输，可以存储896种分析结果的数据

Note：All specifications are approximate and are subject to change.
注：所有规格都是近似的，最终的变更为准。

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